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BRIEFLY TOLD.

DEATH OF MR. ALFRED H. SOMERVILLE.—The death of one who passes away even in the fullness of years is a trial hard to bear by those who, either through kinship or the ties of friendship, were close to the deceased; but how much severer is the grief-trial where death, in swift and cruel fashion, cuts down a loved one in the veriest blossoming time of manhood. It too often is our sorrowful duty to chronicle the passing away of the old, the middle aged and the young, but not before have we been called upon to perform the task of placing on the record an account of a death more sorrowfully tragic than this. Divested as much as possible of the harrowing features of the occurrence, the details of the accident which cost Mr. Alfred H. Somerville his life, are appended. Mr. Alfred H. Somerville, who was a son of Mr. James Somerville, Superintendent of the Indianapolis (Ind.) Gas Company, while engaged in the performance of his duties as Superintendent of the Pintsch system department of the Indianapolis Gas Company, on the morning of May 23d, had his attention called to a slight leak in a naphtha tank that fed into the pipes leading to the retorts. He immediately started in to repair the break. The naphtha was under considerable pressure, and it spurted out in a fine stream, saturating his clothing in very quick time. The break took more time to repair than Mr. Somerville anticipated, and meanwhile the vapor from the escaping naphtha communicated with the fire under the retort bench and a line of flame shot back to the leaking point. In an instant Mr. Somerville's clothing was ablaze, and before assistance was at hand he had received injuries of a nature so severe that his death occurred in a few hours. Deceased, who was in his 21st year, received his education in the High School, supplemented by a course in Butler University, and was a clever, painstaking, thorough youth, whose future in the profession of gas engineering was seemingly assured. The funeral services were celebrated in the Fourth Presbyterian Church, Indianapolis, on the morning of May 26th, the Reverend G. L. McIntosh officiating. At the time of the fatal accident the father of deceased was in attendance on the General Assembly of the Presbyterian Church, convened this year in Saratoga, N. Y.; and out to him will go in fullest measure the hearty sympathy of the fraternity in his great bereavement.

ACTING-GOVERNOR WOLCOTT VETOES THE MASSACHUSETTS PIPE LINE BILL.—It is with unbounded satisfaction that we announce the veto, by the Acting-Governor of Massachusetts, Mr. Roger Wolcott, of the bill passed by the Legislature of that State conferring most amazing powers on the promoters of the Massachusetts Pipe Line Company in respect of the gas supply of the State. We congratulate the Acting-Governor on the stand taken by him over this extraordinary measure, which was a menace to everyone connected with the legitimate supply of gas in the State, in that it put their properties largely at the mercy of the pipe liners. In our next issue we will print the full text of the veto message, and regret our inability to publish it this week. The delay is unavoidable, however, for our copy of the message came to hand too late. The message is a vigorous document, and it bristles with common sense and honesty. We quote one paragraph from it: "Are the claims of these promoters verified and established upon the systems now within their control? It will be time enough, in my judgment, to grant the exceptional privileges of this bill when, in the field now controlled by them, they shall have been able to verify the claims, upon the mere promise of which they ask for this bill." The straight gas makers of the State are to be congratulated over the united action taken by them in opposition to this pipe line scheme, which unity was amplified and strengthened as the contest lengthened. Again we tender our congratulations to Acting-Governor Wolcott.

DEATH OF MR. THOMAS L. BARRET.—We regret to announce the death of Mr. Thomas L. Barret, who passed away, at his home in Louisville, Ky., on the morning of June 2d. Mr. Barret was born in Munfordville, Hart county, Kentucky—which place is perhaps 75 miles south of Louisville—February 24th, 1825, and finally settled in Louis-

ville in 1845. He directed his attention to banking matters, and at the time of death was undoubtedly the leader of the banking interests of the Southwest. For 30 years he directed the operations of the Bank of Kentucky. Of course, outside of finance his business interests were important; and notable among such interests was the one held by him in the Louisville Gas Company. As almost every gas man in the country knows, the engineering management of that Company has for years been vested in one of his sons—Mr. A. H. Barret. Deceased was a true specimen of the scholarly, dignified Southern gentleman, and no other man occupied a higher niche in the esteem and regard of his contemporaries.

NOTES.—The City Gas Light Company, of Norfolk, Va., has been purchased by a syndicate in which are interested Messrs. H. B. Hollins & Co., Hollister & Babcock, the U. S. Mortgage and Trust Co., A. C. Humphreys and J. D. McIlhenny. Messrs. Humphreys and McIlhenny conducted the negotiations, and these two gentlemen will be responsible for the management of the property. We understand the local officers will remain as at present. Meanwhile, in order to better assimilate the interests involved, Judge Hanckel, of Norfolk, has issued a charter to the Norfolk Gas and Electric Company, which will in due time take over the properties purchased. The charter states that the purpose of the Company is to distribute and sell gas and electricity for lighting and heating; that its capital shall not be less than $25,000 nor more than $500,000, divided into shares of $100 each, and that it is empowered to hold real estate to the extent of 20 acres. The preliminary officers are: Directors, Samuel B. Lawrence, R. A. Dohie, Jno. B. Summerfield, O. F. Smith and Jas. W. Willcox; President, S. B. Lawrence; Vice-President, R. A. Dohie; Secretary and Treasurer, John B. Summerfield.——The Syracuse (N. Y.) Gas Company has, through agreement with the American Express Company, established sub-offices at several points in the city for the greater convenience of those who have to settle monthly gas accounts.——The proprietors of the Nanticoke (Pa.) Gas Company have established the dollar rate in that city. As a result orders for services are coming in thick and fast.——At the annual meeting of the Georgetown (D. C.) Gas Light Company the former Board of Directors was re-elected, viz.; Messrs. Henry C. Winship, Frank Paul Leetch, S. T. Brown, Wm. B. Orme, John Marbury, M. J. Adler, George L. Nicholson and William Leetch. The Board perfected the following organization: President, H. C. Winship; Secretary and Treasurer, Frank P. Leetch.——The bid submitted by the Gas Light Company, of the City of New Brunswick, N. J., under the proposition of the authorities of that place for the public lighting thereof for two years was: 373 gas lamps, on a yearly table of 1,362 hours of lighting, $12.26 per lamp per year; for each additional hour the additional charge to be one cent per lamp per hour. Last year the rate paid was $12.94 per lamp per year.——A correspondent forwards the following under date of the 2d inst.: "The annual meeting of the Johnstown (Pa.) Gas Company was held in the Directors' room, at the First National Bank, yesterday, and 1,598 shares were represented out of a total of 2,000. The old officers were re-elected, as follows: President, James McMillen; Treasurer, John D. Roberts; Secretary, A. H. Walters. The erection of a new coal gas plant is contemplated by the Company. The output has increased to the full capacity of the present apparatus, and as there is no room for extensions on the site which has now been occupied for nearly 40 years, it is necessary to seek a new site, which will probably be chosen at a point between Broad street and the Pennsylvania Railroad, in the 16th Ward. Work on the new plant will probably be commenced within the next few months and pushed to completion. The present site will be abandoned when the new one is built upon. The history of the Johnstown Gas Company is the history of the progress of Johnstown from a village to a great manufacturing city. Starting with a few consumers in 1857, the Company's patrons now number nearly 2,000. The works were entirely destroyed in the flood of 1889, but were at once rebuilt and gas sent out on Christmas Day of the same year."——The Glens Falls (N. Y.) Paper Company is making extensive alterations and additions to its plant, and on its new buildings it is placing roofs supported by steel trusses, which form of construction is especially adapted for buildings devoted to the manufacture of paper. In fact, in this line, wherever new buildings are put up or old ones remodeled, steel is almost invariably used. The trusses for the new work which the Glens Falls Company is having put up will be furnished by the Berlin Iron Bridge Company, of East Berlin, Conn. The new buildings will be arranged for a machine room, 67 feet wide and 217 feet long; a machine room, 52 feet wide and 167 feet long; a finishing room, 50 feet wide and 100 feet long; and two boiler houses of somewhat smaller dimensions.

Then and Now: A Study in Retort House Economics.

[Prepared for the JOURNAL, by Mr. Frederick Egner, Norfolk, Va.]

We read and hear sometimes that no progress has been made in the art of coal gas making for many years. To show that said charge is not well founded, and incidentally, also, that the cheapest thing at first cost is not the most economical thing in the end always, even in retort house work, is the object of this article. By way of explaining some of the statements following a few personal remarks will, I trust, be pardoned by the reader. The writer more than 20 years ago was (though then a very young man) in charge of a retort house, where 840 retorts were at one time in operation, and 4,000,000 cubic feet per 24 hours not an uncommon make. The figures given in Example No. 1 are taken from the writer's experience of that date; but, in order to bring the results more within the scope of the greater number of existing works, only one "Gang," as there employed, is quoted. However, it is a fair average, and hence suitable for the purpose. For the results upon which figures in Example No. 2 are based, the writer is indebted to the Superintendent of Manufacture of one of the largest, most successful and well managed gas works in this country. Example No. 3 may surprise many of the readers of the JOURNAL, but they are assured that the statements therein given are based upon well-authenticated facts.

For purposes of comparison, it may be admitted that 5 cubic feet of good gas can be obtained per pound of coals carbonized (of a certain mixture), and that this coal will yield 59 per cent. by weight in coke, of which 2 per cent. will be breeze. As a matter of fact, the author states that 18 per cent. by weight of the coal carbonized was the coke required as fuel in the benches about to be quoted in Example No. 1, and that 12 per cent. coke used, figured on the weight of coal carbonized, is assumed to be the result in Examples Nos. 2 and 3. This accords with his own experience with well-constructed and managed regenerative furnaces, using good coke. The figures given as the cost of apparatus are all based on actual work within the writer's experience and statements of the party previously mentioned, and Example No. 3 is an estimate founded upon reliable data. The figures are, if anything, a little higher than present prices would warrant; yet they may be still higher shortly, or lower. The professional reader understands that these things have no fixed price, but for the present end they are sufficiently accurate.

The scale of wages the reader can alter to suit himself. That given is customary in a number of locations East and West. The amount of gas produced, as per Example No. 1, is assumed for the other two as well, for obvious reasons; and the weight of charges, duration of same, and men employed are, as was stated, based upon actual work known to have been done.

EXAMPLE No. 1.

A ground-floor retort house; ordinary fire bar furnaces; 8 settings of 6's; retorts, 9 ft. 3 ins., by 14 ins., by 23 ins. inside measurement; form, semi-eliptical; charge, 325 lbs. each 4 hours. About 6.25 per cent. of the retorts in action required for "scurfers," which leaves us 45 retorts charged out of 48 in action. Gas made per retort and day (charged), 9,750 cu. ft.; and for the 8 benches, 438,750 cu. ft., in 24 hours' maximum make; corresponding to 87,750,000 cu. ft. per annum.

Cost of Construction.

8 benches complete, at $1,260	$10,080.00
Retort house of sufficient dimensions (ground floor)	4,200.00
Total cost of construction	$14,280.00

Cost of Manipulation.

8 firemen, at $3.00	$24.00
4 helpers, at $2.25	9.00
2 luters, at $2.00	4.00
2 coke men, at $1.85	3.70
3 coal men, at $1.80	5.40
Cost for 24 hours	$46.10
Cost per annum (equal to 200 maximum days make)	$9,220.00
6 per cent. interest on cost of construction	856.80
Wear and tear of benches, building and tools	1,288.00
Extra fuel required (excess over 12 per cent.) value, at $3.00 per ton	815.04
Total cost of manipulation	$12,179.84
Cost per 1,000 for retort house manipulation only	$0.1388
Cost per ton of coal carbonized	1.5545
Capital per retort set	297.50
Capital per 1,000 cubic feet retort capacity (in action)	32.54

EXAMPLE No. 2.

A stage floor retort house, containing 7 benches of 8's, with regenerator furnaces and steam drawing and charging machinery. Also, coal bins and elevators and coke conveyers; in fact, all modern improvements. The retorts are ovals, 9 ft. 6 ins. by 16 ins. by 25 ins. inside, and are charged with 330 lbs. of coal every five hours, with about 1.07 per cent. idle retorts allowed. The amount of coal handled, as well as coke and gas produced, is of course about the same as per No. 1; but coke used less, as previously stated.

Cost of Construction.

7 benches of 8's, with regenerator furnaces, at $3,400	$23,800.00
Coal bins, elevator and coke conveyer	2,400.00
Stage floor retort house	8,736.00
One drawing and one charging machine complete	11,000.00
Total cost of construction	$45,936.00

Cost of Manipulation.

2 machine men, who also help otherwise, at $3	$6.00
2 firemen, at $2.75	5.50
2 helpers, at $2.12½ per day	4.25
Cost for 24 hours	$15.75
Cost per annum (equal to 200 maximum days make)	3,150.00
6 per cent. interest on cost of construction	2,756.16
Wear and tear of machinery, benches, building, etc., and tools	3,002.64
Extra fuel, cylinder and lubricating oil for machines	193.50
Total cost of manipulation	$9,102.30
Cost per 1,000 for retort house, manipulation only	0.1037
Cost per ton of coal carbonized	1.1617
Capital per retort set	820.28
Capital per 1,000 cubic feet retort capacity (charged)	103.57
Saving per annum over the cheaper "old plan"	3,077.30

EXAMPLE No. 3.—*Discharging and Charging Retorts by Gravity. (Inclined Retorts.)*

Coal carbonized, coke and gas produced the same as the two preceding examples, per day and year. Retorts set at an angle of 32°, 18 ft. long on the slope, and 22 ins. by 16 ins. in section, inside.

Be it remarked here that retorts ranging from 12 ft. to 20 ft. long have for some time past been in entirely satisfactory operation at 17 gas works in England, and on a large scale at one gas works on the Continent. The author has entirely reliable data on the subject, which will be made public in detail later on. The example of the 18 ft. retorts is taken at this time merely as a matter of convenience. But, to proceed:

The retorts are charged every six hours with 616 lbs. of coal, which is thoroughly carbonized. With similar furnaces and like coal as in the other two examples, it is fair to assume that the amount of gas, etc., produced and used, will be in the same proportion as mentioned in Example No. 2.

Cost of Construction.

4 benches of 9's (size of retorts as above) and producing 12,000 cubic feet of gas per retort and day, at $4,858.52	$19,434.08
Stage floor retort house	4,958.50
Coal hopper and bin, elevator and coke conveyer	2,400.00
Total cost of construction	$26,792.58

Cost of Manipulation.

2 men charging and doing other work, at $3	6.00
2 men drawing and doing other work, at $3	6.00
2 helpers, at $2.25	4.50
Cost for 24 hours	$16.50
Cost per annum (equal to 200 maximum days' make)	3,300.00
6 per cent. interest on cost of construction	1,607.55
Wear and tear of benches, building and apparatus and tools	1,725.00
Total cost of manipulation	$6,632.55
Cost per 1,000 for retort house manipulation only	0.0755
Cost per ton of coal carbonized	0.8465
Capital per retort set	744.23
Capital per 1,000 cubic feet retort capacity (in operation)	62.01
Saving shown per annum, over Example No. 1	5,547.29
Saving shown per annum, over Example No. 2	2,469.75

It is only fair to state that, in Example No. 2, the machines could have served 112 retorts very well, instead of only 36, and, of course, with a corresponding increase in economy. The machines require at least 16 feet clear space between the walls of retort house and the mouthpieces, whereas the "inclines" require much less; but as to the labor required, the proportion will be about the same, if more retorts are charged. The work shown in Example No. 1 will be acknowledged, by those having experience in retort house work, to have been very heavy. The author knows that only the best of men—physically speaking—could stand up under it; and when on a certain occasion the men stopped work for a season, not 10 in 100 of men who applied for work were finally found able to do it. How often has the writer been moved by compassion to the core, when obliged to urge on that terribly exhausting work, as per Example No. 1, and wished some method might be devised to eternally wipe such work off the earth. Water gas did it in a measure, but the reader knows also the drawbacks of that system, economically considered. Machine stoking was a big step, as shown, in advance; but it cannot well be applied at smaller works. But charging and discharging by the force of gravity is applicable everywhere, and, with regenerative furnaces, greatly simplifies the making of cheaper coal gas, or even making the carbureting portion for water gas, from the rich cannels on the market.

What the results might have been had 4-hour charges instead of 5 and 6-hour ones been the rule in the Examples No. 2 and 3, must be left to the reader's imagination, for the writer only quoted results as he had them given to him; only let it be again remarked, that these results *are well authenticated.* It will be observed also that the "cost of manipulation" was strictly confined to retort house work and apparatus; but it has been shown—it is hoped, to the reader's satisfaction—that there *is* good reason for the belief that the cheapest first cost does not always represent true economy or ultimate gain, and that it would probably pay many a one to go a little deeper than "first cost" in especially gas apparatus; especially because it is not true that no improvements have been made of late in the art of cheapening coal gas manufacture. "Q. E. D."

[OFFICIAL REPORT—REVISED BY THE SECRETARY.—Concluded from page 886.]

SECOND ANNUAL MEETING OF THE TEXAS GAS AND ELECTRIC LIGHT ASSOCIATION.

HELD AT THE ORIENTAL HOTEL, DALLAS, TEXAS, May 12 and 13.

FIRST DAY—AFTERNOON SESSION.

The proceedings of the afternoon of the first day were opened by the reading of the paper, by Mr. L. T. Fuller, President of the Calvert (Tex.) Water, Ice and Electric Light Company, entitled

ELECTRIC LIGHT COMPANIES AND THEIR CONSUMERS.

Mr. President and Members of the Association: The subject to which I wish to call your attention is so very broad and comprehensive that I do not feel capable of undertaking the task of enlightening you thereon; but I hope what I say may bring out information from some of our better posted members, who are more fully posted than your humble servant.

Since the introduction of electricity for the purpose of illumination there has been a continual advancement in its progress. It is unnecessary for me to enter into the history of the various systems and of the great minds that invented them, and who are even now continually searching for new ideas that will improve and make more economical our existing plants. It is unneccessary to say that the electric light plants, as now constructed, are great institutions for the consumers of light, while they cannot all be paying investments for the projectors; and herein lies the important part to the managers—that is, making them pay dividends to the stockholders, for on this depends essentially the value of each and every manager to the plant. We should use every means in our possession to know what it costs us to furnish light. This is something easily said, but can any of you arrive at the cost of furnishing lights at your plant correctly per candle power for one month, either incandescent or arc lights, or both, when furnished from one plant and battery of boilers?

We have our tables and other information, as compiled from what others have done, and what we should do, per ton of coal; also what manufacturers of the various systems claim what their machines will do, and so on. But do we get what they claim out of their machines? Herein lie many disappointments, and our profits go out the smoke-stack to the winds of heaven.

We have leaks in the plants and leaks in the lines, and frequently

consumers who have contracts for so much candle power for a specified time, when in reality they are often beating us by substituting a 32-candle power for a 16-candle power light, for which we get nothing; and at the same time they kick because we do not furnish them good lights. This applies to incandescent lighting, and the smaller plants thus suffer the more from this source. You might say, put meters on such customers, or send out inspectors and cut them out; but this causes considerable annoyance and expense.

Could not this point be discussed more fully among us, and the best way and manner arrived at to deal with consumers of light—that is, to get pay for what we furnish? I have used rigid forms of contract, with penalties attached, etc. This worked for a while, but I found, I am sorry to say, a great number of consumers who seemed to think that if they could use a 32 candle power or a 50-candle power instead of 16, as contracted for, it was only beating the Company, which is a monster corporation, and they can stand it; it is such a small thing, and they need the light. Again, they make a contract for 10 or 12 P.M. lights, and use one of two of them all night, for which we get nothing.

Now, as to the lighting of commercial houses, hotels and public places. I would like to hear the Association discuss this, and the arrangements of the various rates charged throughout the State; also, does it pay to have separate lines in the smaller towns for different hours of lighting? Again, what rates are usually made to residents, and how they are generally managed; also, what percentage of lights are burned in private residences to the number wired, and would it be advisable for prices to be governed by number of lights wired in private residences, with and without meter system. That is, to have a minimum rate per light wired, whether there are any used or not, as it may often be the case that a large investment is made in machinery which has to be maintained as a reserve for a number of lights wired and paying no dividend Is there any way to control the sale of lamps and to prevent cheap and inferior lamps from being used in your system? I do not know how you all find it, but the great number of manufacturers of incandescent lamps are so anxious to sell that they sell to anybody who will buy; thus a great many inferior lamps are put in use and are being sold by even the corner grocer, who sells them as in former years he sold lamp chimneys. This is even a great detriment to the plant, and causes a loss of a large amount of energy.

Regarding settlements, I believe this to be a subject that should be fully discussed, and which may interest all members of the Association: First, how to secure prompt settlement for service rendered; second, system used in making collections, either by rebates or making discounts for prompt settlements; third, consumers in arrears, and manner of disposing of same.

If the above remarks and subjects suggested for your consideration are thoroughly discussed, I believe the result will be of mutual benefit to our Association.

Discussion.

The Chair—Mr. Fuller's paper is now open for discussion. May I ask how an electrical company, at the end of a month, can tell how much current was made during the month and how much was sold, and, therefore, how much was unaccounted for?

Mr. Cullinane—That subject has evoked considerable discussion among the electrical fraternity, who have had a great deal of trouble in getting satisfactory meters to register the amount of current supplied to the consumer. I regret that the electrical concerns, unlike the gas meter companies, have no accurate meters to measure the current supplied to consumers. In the early days of the gas business they had no meter and they sold by contract, but it was not until the meter came that the gas business was made a success. I hope the day will soon come when every central electric station will have an accurate recording meter, and that the meters in consumers' houses will be accurate. It is now a matter of guesswork in the electrical business how much you sell and how much you lose.

Mr. Judge—The only standard we have in our plant is the wood pile (we burn wood mostly). We know what our fuel costs and how much we use every month. We can tell our make through knowing what the cost of material, labor, repairs, etc., is, without having any meter at all.

Mr. Cullinane—I cannot agree with Mr. Judge. He might evaporate a certain amount of water one month, whereas next month, with a dirty boiler, he would not evaporate nearly so much.

Mr. Eddy—We have 1,800 incandescent electric lights in our plant. Whenever I advocate the installation of meters my stockholders say to me, "Will it increase our earnings?" My only answer to that is, "If it does not increase your earnings you will get paid for what you turn out." But with pencil and paper I have never been able to prove to my company that it will earn any more money than it does now at a flat rate.

Mr. Oliger—I think, in the small towns, the flat rates are much better than the meter rates; especially as the meters do not seem to be absolutely correct.

Mr. Cullinane—That is a question I had under consideration for some time, and I came to the conclusion that there never has been an A1 meter on the market. I believe if the stockholders in our and other companies could be made to believe that there was an A1 meter on the market they would put meters in all of their plants. The only way to solve the question is to get a meter like that used in the gas business, and then we will be able to stand pat; and we will all have to do that in the electrical business some day.

Mr. Taylor—We do business on a flat rate, and when we wire a house the consumer usually asks, "How long can I burn the lights?" and I tell him, "You can burn them from the time the dynamo starts up until it shuts down, and you are welcome to burn all you want for the price you pay." We have never had a row in our town. Sometimes we start up at 2 o'clock in the afternoon and do not shut down until 11 the next morning.

Mr. Starr—In Gonzales we run by water power. Our rate is a flat rate, and we collect strictly in advance. In Luling, where we run by steam, we use meters in the outskirts of the town, but in the city, where I can watch them, a flat rate rules. If we find that people on a flat rate are using more light than they have contracted for, we make them pay the difference. I generally visit all my customers in Luling who have a flat rate.

Mr. Oliger stated that he did as Mr. Starr did. If the consumer kept burning his lights longer than he had contracted to pay for, on the third time such deviation was discovered his lights were cut off entirely.

Mr. Cullinane—What kind of a meter does Mr. Starr use?

Mr. Starr—In Luling we use a watt meter, and have not had any trouble with it at all. Whenever there is any complaint I take the meter to the station and test it.

Mr. Oliger—How do you arrive at the accuracy of the meter?

Mr. Starr—Well, I test them, and they all usually show up about the same; but there may be a few watts difference. I take the number of watts and divide it by the number of lamps, or the number of watts to the lamp that you are using.

Mr. Cullinane—As stated before, what we want is an accurate electrical meter. We should be able to swear that the electric meter is accurate, like we do with a gas meter.

Mr. Monroe—The point established by Mr. Cullinane is one of the strongest arguments in favor of the meter system. You will find that in the course of the next two years it will be utterly impossible for any central station to sell its commodity on other than a meter basis. It has been asked "How can you tell what the efficiency of your lamp is?" You have to assume that, in the absence of testing instruments. Why should you not be paid for a 75-watt lamp? If you are on a flat rate you are burning a lamp which takes just one-half as much more current as a lamp that will do the same work, and you are getting nothing for it. If you are on a meter basis you will find out that meters are running fast, or your customers will tell you so. How can you check it up? You must get at the efficiency of the lamp. As soon as you do that you will remedy this to a great extent. You will make more money for yourselves and save money for the consumers. In regard to the accuracy of meters, it is an established fact that there are meters on the market which are guaranteed to be absolutely accurate. As a representative of one company I will guarantee a ten-light meter, which I will sell, to be absolutely accurate on anything over two lights, and to record within 5 per cent. of accuracy on one light. With an ampere meter, that cannot be said, owing to the fact that, by increasing the amperage—say, for instance, a meter is adjusted for 52 volts, it is calibrated for that voltage. On an alternating current, where the voltage is fluctuating, the voltage increases say to 53, and your meter records 2 per cent. slow. On the other hand, if your voltage drops to 51, that is only allowing 1 volt, your meter over-records 2 per cent. If your voltage runs down to 50 or 49, your meter over-records 4 or 6 per cent. What does that amount to in a year's time to the central station manager, who uses an ampere meter? The conditions are entirely changed by the use of a watt meter. The watt is undoubtedly the true unit to measure by; it is a fixed fraction of a horse-power, and a horse-power is the basis of computation in determining a station output. I do not care to discuss this matter further at present, as I may want to say something on it later.

The Chair—That has interested me for some time, and what I will

say will be from the standpoint of a gas man. I believe you will all admit, from statements I made this morning, assuming them to be correct, that the ordinary gas jet gives only one-sixth of the efficiency that the Welsbach burner does. If I sell two men 1,000 cubic feet gas each, one of whom burns a Welsbach light and the other an ordinary gas jet, the man who uses a Welsbach burner gets six times as much light—that is, he takes as much material as the one who burns it through an ordinary gas jet; but one has used it efficiently and the other inefficiently. The same will probably apply to electric lights. If one uses 1,000 watts efficiently and the other uses the same amount inefficiently, it has taken just as much steam to deliver it. I have always maintained that the only way to do that business was with a meter, and I tell people, when they talk to me about our meters not being reliable, that if they are not we might as well shut up shop and quit business; that if we cannot rely on our measurements neither can the grocery man on his scales, nor the dry goods merchant on his yardstick. Is it possible with a watt meter for a man to have had a large bill for watts and have had a poor light, and his neighbor have the same bill and have had an elegant light?

Mr. Taylor—I think so. Ours are ampere meters, and we sell on a basis of the ampere hour. The flat rate consumers sign a written contract stating the limit of time that the light will be burned, and I believe it is only in isolated cases that we have consumers who overstep the bounds of their contract, and if they do violate the rules of the company and the terms of the contract we shut them off and do not turn them on again for some time.

The Chair—You make a contract on the basis of a certain size lamp?

Mr. Taylor—Yes, sir; on the 16-candle power lamp.

The Chair—Suppose he gets 32's and puts them on, when he is on a flat rate; how do you find that out?

Mr. Taylor—I never had such a thing happen.

The Chair—You mean, you do not know of anything of the kind happening?

Mr. Taylor—No, sir.

Mr. Monroe—If the consumer who put on a 32-candle power lamp was on a meter it would most certainly show up against him, because the meter would register more, and the company would get paid for the extra light furnished.

Mr. Judge—Theoretical accuracy seems to be very desirable, but my experience is that perfect accuracy is a very rare article. Take a gas meter; it may not be entirely accurate, but if it is within 2 per cent. of perfect accuracy it is considered a correct meter. We find that the Schulenberger meter, for all practical purposes, is accurate, but the great trouble I find with it is that it does not register with one light burning; and I presume that the watt meter will be the same.

Mr. Starr—Well, I have had a meter run when the current was entirely shut off. If a meter gets any vibration it will run when the current is off.

On motion, Mr. Fraser, the City Electrician of Dallas, was called upon to address the Association on the subject. He spoke as follows:

Mr. Fraser—There are so many different circumstances surrounding the subject that I believe it is a hard matter to find any two men of the same opinion in regard to the use of meters. As far as their accuracy is concerned, my experience is that if you buy a good meter, manufactured by a standard, responsible company, you get an instrument that will be accurate enough for any use it may be put to in the electrical business. I believe there are a great many evils to be contended with other than this meter question, and that superintendents, instead of walking around to see that their customers do not use more current than they pay for, ought to pay more attention to examining their lines and connections around the engine house. I believe that there is more loss at the end of each month from leaks in 90 per cent. of the central stations in this part of the country than there is in stealage by the consumers. If the gas companies were to put their pipes through the city and run them up to consumers like so many of the so-called electricians do, they would at the end of the month find themselves coming out at the wrong end of the pay roll. I believe, as stated before, if the superintendents watched their lines and saw that connections were properly made, and that consumers got the candle power that they paid for, there would not be much stealage. I believe that at the end of every six months electric light meters should be taken out and cleaned, as they are delicate instruments, balanced on jewels, and unless the case is dust-proof they are going to get out of fix. If a watch that is set on jeweled bearings gets full of dust it gains time instead of losing it, and I believe it is the same way with a meter—the more dirt it gets the more it registers. I would rather see meters put in a plant, if they were given proper attention and standard meters were purchased, and I believe it to be the only system that a plant should adopt. I believe in good construction, and while I have heard a great deal about electrical fires caused from electric light wires, I do not believe there ever was a house burned down from that cause. In Dallas, before any current is turned on, all the work is inspected and no light is allowed to be turned on until that has been done. I think that none but competent men should be employed, and I believe that any man desiring to go into the business should be examined by a competent board, and should also be put under a bond to do nothing but good work.

The Chair—You said you did not know of a fire that had been caused by an electric light wire. Did you ever know of a current arcing across a cut-out and going in on a house wire?

Mr. Fraser—I do not.

The Chair—I knew of a case in Fort Worth, where, during a storm, a house was set on fire by the electric wire, and while the house did not burn the timbers were badly charred and every cut-out and lamp in the house was destroyed.

Mr. Monroe—It is possible that the house in question had a transformer attached to the building. There is no connection between primary and secondary wires, and it would be impossible for a secondary current to arc across a very small space, and there is no danger from a secondary wire.

Mr. Fraser—Regarding transformers, a superintendent should never allow them to be placed on the building, and that was the case at Fort Worth to which Mr. Miller refers. The primary wire is not a light wire.

The Chair—If it was not a light wire, what do you call it? It is used for nothing else.

Mr. Fraser—I see where an erroneous impression has been caused by all present not being electric light men. When we speak of light wires we mean wires that only run into the house for secondary current, and not the primary current wires at all.

An adjournment was ordered, to 10 A.M. of Wednesday, May 13th.

Second Day, Morning Session.

On motion a vote of thanks was tendered the citizens of Dallas and the Arrangement Committee for the handsome entertainment given the Association on the evening of the 12th May.

Mr. Monroe responded on behalf of the Arrangement Committee, stating that he was fortunate enough, in connection with Mr. Miller and Mr. Lord, to be on that Committee, and that the entertainment on the previous evening was the only available form of entertainment that could be given, and that for this they were more indebted to the citizens of Dallas than the Arrangement Committee.

Two Committee Reports.

The report of the Secretary-Treasurer having been read and approved. the Special Committee appointed to consider the President's Address handed in the following report:

"We, your committee to whom was referred the annual Address of the President, beg to recommend the adoption of those portions of his address as follows: To appoint a committee on revision of our Constitution and By-laws, to consist of three, and request them to report on same at our next annual meeting. For the consideration of the Association on legislation we would suggest that this Association wait, at least until the next annual meeting, before acting on the subject. We would recommend that the President be authorized to appoint the necessary special committees for the transaction of such business as may be required for the benefit of the Association. We recommend the adoption as a whole of that portion of the President's address which refers to notifying presidents and managers of gas and electric light companies of the advantages of our Association. We would also recommend that a committee be appointed on membership, also that our Secretary be paid the sum of $20 per annum for his services and be exempted from dues. Respectfully submitted,

L. T. Fuller,
Harry L. Monroe,
Jno. H. Fitzgerald, } Committee.

Mr. Monroe—Since signing that report I believe it would be a good idea to appoint a committee to confer with the Texas Street Railway Association and let this committee report at the next meeting the best plan of action to be taken on the matter referred to at the close of our President's address on legislation. We will be glad to take the matter up and get not only our own views of the matter but that of other Associations.

Mr. Fitzgerald—Regarding the committee on legislation, I do not know what advantage it would be at the present time, unless the com-

mittee went to the capital during the session of the legislature, but in order to do that it would be necessary to expend between $25 and $30 a day, and I do not think our present financial condition will justify any expense of that kind, and it would be as well to leave the legislative subject alone.

Mr. Monroe—The interests of the two corporations are practically the same, and if we can meet representatives of the Texas Street Railway Association and find out where they have their greatest grievances, and on what basis they expect to fight them, we can save time and expense probably by meeting them on the same ground.

Mr. Fitzgerald—As far as the two Associations are concerned, the interests in the corporation laws of the State are largely identical, and what would be of advantage to one would be of advantage to another.

Mr. Monroe—I think the combination would be a good one and of great benefit to both.

Mr. Fuller—It seems to be the tendency of the times to adopt legislation adverse to the interests of corporations. You will find that in talking this matter over among ourselves what we said here might get out, and the people at the forks of the creek begin to get antagonized at the start before we even investigated the matter. I think it proper to let the thing rest, for the present anyway. I would not consent to a combination at the present time. After the election is over we can all look into these matters and come up here prepared to ascertain wherein we can benefit ourselves on the subject of legislation. I do not believe it would be advisable to raise that point now.

The Chair—This Association was formed for the benefit of members in a technical way. It was not my idea in going into it that we were to become lobyists or politicians in any sense. I think we can heartily endorse any action looking toward more conservative and reasonable legislation on subjects pertaining to our interests, but I do not believe that we can afford, as a body, to take any action on matters of this kind. I do not think that was the object of this Association when it was formed, and I do not think the Association will ever succeed if it becomes such an institution. I do not believe that this Association ought to take up that matter now, but think that it ought to be taken up by an Association formed with that end in view, and I expect that some of our stockholders would strenuously protest against their representative in this Association taking any action on that point.

Mr. Fuller—I think Mr. Miller hits the subject squarely. It seems to me that the stockholders of the corporations we represent should take action themselves, if they desire to do so, that we are going a little beyond our power if we do this, and they can do it more effectually than we can as an Association.

Mr. Monroe—I made the remark merely as a suggestion in order to hear the opinion of the different members of this organization; and I am not in favor of going to Austin, or anything of that kind. The last legislature threatened a bill in the line of directing street car companies to put their wires underground, and at that time it had not been done successfully If such a bill as that should be passed you can see what it would mean to the electric light companies later on. Everyone of them would be required to put their wires underground, and I believe it would be to the interest of all concerned to keep in touch with these matters.

The Chair—If there is no further discussion on this subject, the question is on the adoption of the report.

The report was adopted.

Mr. Judge was called to the chair, and Mr. T. D. Miller, of Dallas, read the following paper on

FIXED AND VARIABLE EXPENSES IN MANUFACTURING PLANTS.

The results of a discussion of this subject may not be susceptible of exact mathematical demonstration of the correctness thereof, and no matter how exhaustive the argument may be, how perfect the syllogism or logical the conclusion, some one is sure to take issue on it. And he in all probability will not attack the conclusion, but the premises.

What constitutes the fixed and variable expenses of a manufacturing plant? We might diagram as follows:

- Cost of manufactured article.
  - Fixed items.
    - Interest on investment.
    - Depreciation.
  - Variable items.
    - Wages, salaries and fees.
    - Material.
      - For manufacture.
      - For maintenance and repairs.
    - Expense.
    - Taxes and insurance.

Variable Expenses.—Wages, salaries and fees should include all wages for the manufacture of all articles to be sold, and for all repairs to apparatus, tools, implements, machinery and buildings; all salaries of officers, clerks, accountants, salesmen and collectors engaged on account of and for the conduct of the manufacturing and vending of the articles dealt in; all fees for expert work, attorneys, costs and damages.

Material should include all raw material purchased for manufacture, as well as supplies to be used in the operation of the plant and finishing the manufactured articles; all material used for repairs and maintenance of the plant. It frequently happens that a doubt will arise as to whether a repair made has not bettered a particular piece of machinery, and is, therefore, properly chargeable to betterment account. It is the better plan in such case to give the repair account the benefit of the doubt, and charge to that account.

Taxes and Insurance.—These should include all Federal, State, county and municipal taxes, and all insurance of every nature.

Expense.—This should include all other items of cost not otherwise enumerated, such as advertising, stationery, postage and rents. When it comes to the bookkeeping, the accounts can be amplified to any desirable extent, or condensed to the one item of operating expenses. It is not the object of this paper to go into general detail of this character, nor does it appear to the writer that any of the foregoing points are open for discussion, but that all will admit of the correctness of the general principle stated.

Fixed Charges.—In making your reports to boards of directors of private corporations, the variable expenses are all that are put into the cost of manufactured articles, and the fixed items are disregarded in your reports; but you have not lost sight of them, or should not, for it is only a question of time when these directors will be called on to decide on ways and means to put in new apparatus to replace the old, worn out or too small appliances. Then is the time your depreciation charge will come in some form or other, if it has not already been made.

It is but a simple matter at the end of a year to say expenses have been this amount, receipts that amount; ergo (this being less than that), profits so much. But it must be remembered that that profit has had the benefit of two sources of aid with which it has not been charged. Capital is as worthy of its hire as the muscle and sinew of the wage earner or the brain power and diplomacy of superintendent and manager. Capital is also entitled to have the value of the investment maintained, and should not be expected to accept a small percentage as sole consideration, and at the expiration of a score or less of years be represented by a junk heap. In other words, there are many items of expense which are retrograde in their nature. Items that cannot but be estimated for the future, and some of them with the greatest uncertainty, but which make themselves very apparent after months or years, manifested by a general tumbled down appearance and an expensively operated plant, usually coupled with an inferior article manufactured.

Apparatus wears out or becomes too small for its duty and has to be replaced by new and larger appliances, the old becoming of practically no value. Improvements in methods prompt the remodeling of old apparatus at considerable expense. All involve expense, much of which should be charged to cost of manufacture; just how much will in all probability be left to your judgment, and you should bear in mind that it is as important for you to maintain the value of your plant on an equilibrium with your capital as it is that you should make a large showing of earnings; for much spent on betterments will call for better results from an economic standpoint in your manufacturing account. Herein a great danger lies for the manager who desires to make a large show of profits. This may be done, and often is, by neglecting the plant and taking all earnings for dividends, while the plant suffers seriously. But this sort of thing, of course, cannot be carried on indefinitely, and sooner or later must be met by heavy expenditures. It is not infrequently the case that it falls on a new set of stockholders or a new manager, and often the latter finds some difficulty in satisfying his directors as to why his dividends are not as frequent or as large as his predecessor's of the previous year.

Another method is to charge everything possible, by liberal construction and shrewd arguments to back it up, to betterment account, thereby showing large earnings and handsome betterment account. Any reasonable, tenable plea for a betterment is either one of two things—viz.: An increase in business, with a natural increase in profits, or a reduction in cost of manufacture. Therefore, any promiscuous use of betterment account is likely to serve as a boomerang, in that the expected increase of business, or reduction of cost, fails to materialize. This too often strikes a successor, and not infrequently an indignant one. I am of the opinion that betterment account is like charity and

covers a multitude of sins. If one cannot be perfectly honest with himself, how can he be expected to be with others?

It is a well demonstrated fact that the disregard of proper provisions for the constant depreciation in manufacturing plants has caused much dissatisfaction among stockholders, has bankrupted many companies, and made asses of some superintendents and municipal bodies. Is it better to seem to be a bigger fool than you are, rather than be a bigger fool than you seem; however, in some cases either might be impossible?

Some years ago a certain large city in this country decided that its residents were paying too much for gas, and straightway assumed control of the gas works of the city and reduced the price of gas very radically. Years went by, and this city was held up as an example of what municipal ownership would do with a gas works. It is now only a few years since this same municipality was forced to buy gas from adjoining gas plants whose pipe systems had been extended in the natural growth of the suburban cities within their reach, because sufficient revenue had not been collected from the consumers, the erstwhile owners, to keep the plant up, and it became a question of buying the gas or doing without it. It may be argued that they had the benefit of all these years, but that is certainly a very poor argument in this age of enlightened civilization which recognizes the claims of posterity.

A recent report of a municipal electric lighting plant, not a thousand miles from here, shows a cost per horse power hour of $0.0235. The cost of the plant for which the bonds were issued was $44,000. Interest on these bonds at 6 per cent. is $2,640, or $0.0102 per horse power hour. Taking depreciation at 10 per cent., which would be very conservative, we have $0.0170 per horse power hour, or a total cost per horse power hour of $0.0507. On this basis, a moonlight schedule 2,000-candle power lamp would cost $111.54 per annum, with but little allowance for cloudy weather. Citizens also report the service very poor, and such as any private corporation would be heartily condemned for; in fact, it would not be tolerated. During the period covered by these figures there was no extraordinary expense as the result of casualty.

Another municipal plant similarly situated shows for one year's operations:

Cost of operating per horse power hour	$0.0307
To which should be added 5 per cent. on investment	0.0103
To which should be added 10 per cent. depreciation	0.0206
Total cost per horse power hour	$0.0616

Or, per annum, on basis of moonlight schedule and 2,000-candle power lamp, $135.52 per lamp per year.

A later report from same plant shows—

Cost of operating per horse power hour	$0.0313
To which should be added 5 per cent. on investment	0.0103
To which should be added 10 per cent. depreciation	0.0206
Total cost per horse power hour	$0.0622

On same basis, $136.84 per lamp per year.

Another report, from another superintendent of a municipal electric light plant, gives the following figures:

Cost of operating per horse power hour	$0.0133
To which should be added 5 per cent. on investment	0.0057
To which should be added 10 per cent. depreciation	0.0114
Total cost per horse power hour	$0.0304

On basis of moonlight schedule and 2,000-candle power lamps, cost per annum $66.88. The cost of this plant is reported as $35,000, but reliable information (from another source, of course), gives it at from $75,000 to $85,000. This result is so low that it is interesting to examine the report more closely. The cost of coal per horse power hour was $0.00417. Now, assuming that 7½ lbs. of coal were consumed per horse power hour, it would make the cost of the coal $1.11 per ton; but as a matter of fact, the coal used cost $3 per ton. On this basis of cost only 2.78 lbs. of coal were used per horse power hour—an astounding result. It is but a step from this evidence that this plant was not charged with all the coal it used, and the probability is that the water works was charged with the surplus.

From the first three statements of cost of municipal lights as reported officially, the amount reported is about 60 per cent. of the total cost of the light, and the last report on its face is an absurdity and worthy of no credence whatever. Yet it is just such official figures as these reports of operating expenses that are used in support of municipal ownership of lighting plants. Is it any wonder then that the public is misled by such evidence?

The courts of the country have ruled that evidence that gives only part of the truth is not admissible in any case, and yet it is being done on this subject constantly, by both press and politician.

Truly has it been said that no one is so blind as he who will not see, and of course it cannot be hoped that such an one will be converted until he has been reconstructed so that he not only can see, but will see. It is hoped, however, that all who are willing to see the justice of providing for the fixed items may be made to see it.

Discussion.

The Chair—The paper is open for discussion.

Mr. Monroe—I move that the Association extend its heartiest thanks to Mr. Miller for the paper just read. I consider it a very able paper, for it has touched municipal ownership in a manner which I think it will be to the interest of the members of the Association to attend to more closely. (Carried.)

Mr. Miller—I will say in explanation possibly that some may wish to know where these municipal plants referred to are located. I did not deem it best to put the name of the city in the paper, but if anyone should want to know where they are located and will call on me after the meeting, I will inform him. I do not think there is a boiler or engine man who claims he can make steam with 2¾ pounds of coal per horse power hour. I visited the electric light plant of the Pulaski Gas Company, Little Rock, Ark., several years ago, and the engineer informed me that he was making his steam with 3½ pounds of coal per horse power hour. As he had a new engine and boiler I accepted the statement as a fact, and took it for granted that he knew what he was doing; but since then I have been informed that the way he arrived at his conclusion was to figure the number of lamps that were supposed to be burning. I should say that an average of 7½ pounds of coal per horse power hour was a very conservative estimate of the efficiency of plants in this section of the country, and I have no doubt in many cases it runs up to 10 pounds or more per horse power hour.

Mr. Weaver—A great many claims have been made throughout the State relative to very high efficiency in steam making, but in most cases these claims, when figured out, have been proved untrustworthy.

The Association then adjourned to 2 P.M.

SECOND DAY—AFTERNOON SESSION.

The Chairman called upon Mr. Taylor to read the paper by President W. E. Holmes, of Austin, Texas (who, as said before, was detained at his home by illness), on

MUNICIPAL OWNERSHIP.

Mr. Taylor read as follows:

Gentlemen: Probably the most important problem before us to-day is that of "municipal ownership," or control of lighting and kindred properties, and, as a part of that problem, the right of municipalities to regulate the prices of, and place other unusual and unprovided for restrictions on private corporations operating under unexpired franchises. This question is an active one throughout the civilized world, and confronts us, not as a theory, but more or less distinctly as an active possibility in most of the cities and towns in our State, and our sister cities in all of the other States have the same or different forms of the same disease.

To observant, thinking, practical business men, it is a mischievous evil. The question is, What is the remedy? Widely speaking, it is education. Educate the people in the theory and practice of finance, commerce, manufacturing and in true political economy. If they thoroughly understand the fundamental principles of these four branches, municipal ownership would have no terrors.

Practically, for "home use," kind, patient, thorough and business-like attention to every detail, and no efforts spared to gain and retain the good-will of consumers is a splendid preventive, but it does not always prevent. In fact, in many cases, it seems to increase rather than diminish the cry for "cheaper and more abundant supply;" and this is the great battle cry of the advocates of municipal ownership. I think the best and surest remedy is to require municipalities to make each venture of this nature actually and entirely self-sustaining.

Long experience and close observation show that in most cases, where municipal plants are actually self-sustaining, an individual or a private corporation could take the plant in hand, and under the same conditions make a handsome profit.

The laws of Massachusetts, while not perfect by any means, are probably the most clear, just and equitable of any of the State laws bearing on this subject, and while they give municipalities the greatest freedom and afford them every facility for going into and continuing the lighting business, they are required to buy or build, and to operate their

plants, on a business basis and in a business manner, and to make them entirely self sustaining.

Her laws are guiding and instructive rather than restrictive, and the result is that of the 143 cities and towns where light is manufactured and sold, only 12 plants, and most of these are very small towns, are owned by municipalities.

This is not because of restrictive laws, or for want of agitation, for every city and every town of more than 1,500 inhabitants has officially investigated the matter, but because they are afforded every facility for, and clearly directed and guided in their efforts to ascertain the cost of construction, operation and maintenance of these plants, they usually find that their light is being supplied as cheap or cheaper than they (the municipality) could do.

In our own State municipalities may, and do, buy or build expensive and extensive lighting and other plants, or go almost into any industry they want to, practically without guidance or control by State laws. They may and do charge any price they deem advisable, with entire disregard of cost. If below cost, they may and do tax the property owner to make good the deficit.

They have no uniform or prescribed form for keeping books and accounts. No capable, unbiased, disinterested supervision of books and accounts. No means of ascertaining actual and entire cost of construction, operation and maintenance of these plants. In most cases the accounts are not clear, not uniform, become confused, or form of keeping accounts is changed from time to time; reports are partial and incomplete, are not collected, connected and comprehensive, and no one can really tell what it actually costs to operate and maintain the plant. This is not a criticism, but a statement of facts that is deplored by the men operating municipal plants as much as by the taxpayer who wants to find out where his money has gone.

Municipalities buy or build lighting and other plants, earnestly and honestly believing that they can and will supply as good or better service, and at less cost than a private corporation can or will do. This is because they, from the very nature of the business, do not and cannot clearly and fully inform themselves as to the actual and necessary cost of these plants.

Our business is a complicated one. We are retail and wholesale merchants; we are manufacturers; we have to do with the industrial world, with the engineering world, with the mechanical world, with the scientific world. We must be able to recognize the good and the bad points in the various machines, systems and methods that are placed before us, and to know how to get the best results from each under varying conditions. We are compelled to recognize, sooner or later, that decay (we term it "depreciation") is an item as unavoidable as the labor account, and as persistent as interest on a 10 per cent. note. We deal with the financial world in many ways and under many conditions. We learn the value and use of money in buying in large or small quantities for present or future needs, for temporary or permanent investment. We give years and years of patient study to our business, and find that there is more, much more, to learn. Yet, when some committee, appointed by a City Council, after only a few weeks' investigation, report that it will "only cost so many dollars" (perhaps about half actual cost) "to build, operate and maintain" a supposed or the proposed plant, or some ardent but amateur (usually very immature, notwithstanding perhaps gray hairs and an accumulation of years) financier and philanthopist writes learnedly, and perhaps plausibly, of the advantages of the municipal ownership, and speaks of "excessive and exorbitant charges" of wealthy and soulless corporations, and we stand aghast and wonder whether they are fools or knaves, or both. We forget that possibly if we had devoted no more time and thought to the subject than they had our report or statement perhaps would have differed but little, if any, from the one they made.

Most States are like our own, without, or almost without, laws guiding municipalities in these ventures, and when a City Council appoints a committee, with instructions to "investigate and report as to cost of construction, operation, etc.," the committee, unless composed of exceptionally thorough and clear-headed men, are apt to be misled, and in most cases are misled, by partial, incomplete and disconnected reports and statements of cost, because they cannot obtain, have no means of getting at, reliable data based on actual and continual operation, and considering all items, data unquestionable as to uniformity of items included, reliability and completeness.

If we had laws, clear, just and comprehensive, guiding municipalities in the construction, operation and maintenance of lighting and kindred property—laws not restricted in any way, but simply and clearly requiring that each department keep a uniform, clear and distinct set of books and accounts in most approved business form, showing detail and total cost of plant and equipment, operating expenses, maintenance and income; naming accounts to be kept, items to be charged to each account, requiring books to be closed and published reports to be made at stated intervals; requiring each department to be actually and entirely self-sustaining in all respects, and relieving the taxpayer, as a taxpayer, of any burden whatever in connection with such department—if such laws could be passed to-day, our securities would be worth from 5 to 25 per cent. more to-morrow morning and the taxpayers in our cities saved a great deal of money each year.

Not that we could or would charge more for our products (we could afford to and would charge less, and make more extensive and permanent enlargements and improvements), but that it would give us comparative security against ill-advised municipal plants; for such always mean a sacrifice sale or a long and expensive fight.

Discussion.

The Chair invited discussion on the paper.

Mr. Fitzgerald—This question of municipal ownership has been discussed a great many times and at great length, and the position Mr. Holmes takes there would be very desirable if it were possible to have it. As long as municipalities are controlled by aldermen there will be more or less selfishness. Those men who are instrumental in establishing municipal plants never want books kept to show whether it has been a failure or not, and as long as they can prevent it they never will. The great difficulty in managing municipal plants is that they are all managed on a kind of political basis. They change the managers too often, and put in men in subordinate positions because they are favorites of some one who has a pull. These are some of the things that people have to contend with through the adoption of municipal ownership.

Mr. Oliger—Our friend from Houston struck the keynote when he spoke of municipal plants being handled in a political way for political purposes. For instance, there is a plant (I will not say where) where the superintendent in charge at every election has to put in lights gratis, and unfortunately they are generally saloon lights, so that he could have the proper pull with the boys.

The Chair—I think there is not a city of 5,000 inhabitants in the State of Texas that has not considered the subject of becoming owners of their own plants. I have talked to people in this city who, when the question of municipal ownership was up recently before the people, voted for it, who said that they voted for it without knowing anything of the merits of the case, and considered that it was all right because they favored almost anything for a change.

Mr. Fitzgerald—Does anyone present represent a municipal plant?

The Chair—No, sir; but I will call on Mr. Fraser, the City Electrician of Dallas, to give us his views on the subject.

Mr. Fraser—I am sorry I was not present when this paper was read, as it was the principal one that I wanted to hear. Most of you are aware that this city contemplated on one occasion the building of an electric light plant, and that at the last election it was submitted to the people—not to the taxpayers—generally whether we should build our own plant or not. It was carried by a large majority. Still, the plant is not built. I presume it would be expected of me, the representative of a municipal government, that I would be in favor of municipal ownership. I have been a close student of municipal works for a good many years. The longer one gives this matter his attention and the closer he studies it the less confidence he has in municipalities owning anything. (Applause.) If any of you have noticed when an election comes up—for instance, take last Tuesday week—take your departments where you are supposed to have men who have made a study of a certain branch of the business, that are thoroughly competent to manage that branch of the business; take, for instance, our own engineering, fire or electrical departments. I have seen saloon men, paper hangers, painters, gamblers, and men of every branch of business, who have suffered in a great measure from the moral effects that are sweeping the State, to be out of their positions, who are standing at the office door waiting for a job, and the question is not whether you are capable of filling the position, but whether you have got a sufficient number of friends in the Council to put you in one. Take the electric light plant proposition, and I believe that a city government owning her own waterworks and having all her pole lines throughout the city, should be able to maintain an electric light plant cheaper than the majority of corporations that come into the State. Our experience with electrical corporations is that they come here, build a plant, bond it for three or four times its value, then unload the stock and are gone. The parties who get that stock have to pay the interest on the bonds, which amounts to quite a considerable amount every year. Therefore, they are com-

pelled to charge higher prices for their lights. If the city could take hold of an electrical plant or any other line of business, and have the Council interested in it to the extent of putting their capital into it, and could run it the same as the electrical companies do, and put men in charge to run it properly, it would be all right, but they will put men in charge of plants who do not care whether it pays a dividend or not. They have friends who want a position, from the head down. Probably I am a little outspoken in this matter, but I have to express myself exactly as I feel. I believe if Dallas were to own her own plant that before two, three or four years were over you would probably have some men at the head of it, and not only at the head of it, but all the way down the line, who did not know an electric light from a tallow candle. Therefore, it will be bound to be a failure. Coming down town on a car the other day, a couple of men were talking about municipal ownership. One of them said, "There is Fraser, now; ask him about it." I told them it was all election talk, but as the election was over, about next election time we would hear it again. If the city ordered me to get up plans for an electric light plant, it would be my duty to do it, but at the same time, if called upon, I would feel like expressing myself in the same manner as I have done here regarding the matter.

Mr. McGoldrick—The people of San Antonio have been waiting to see how the municipal plant at Austin was getting on, with a view of running wires from Austin to San Antonio, but they have decided that they will leave it alone.

A vote of thanks was extended Mr. Holmes for his interesting paper.

Mr. H. L. Monroe, of Dallas, Texas, then read his paper on the

USE OF METERS.

What would be the result should any person present go to his coal dealer and say, "I am operating an electric plant, consisting of one 1,000 light incandescent dynamo and one 30-light arc dynamo. I have two 60-horse power engines and two boilers. I start up at 6 P.M. and run until 6 A.M. What will you contract to furnish me coal for per month?" It is not necessary to say that no dealer in his right mind would make a proposition which could possibly be entertained.

Should you go to your gas company and advise them that you had 10 gas jets in your house, one cooking stove and one bath room heater, and wanted a flat rate per month, I assure you that your gas company would rather present you with your entire consumption, and, by so doing, would feel that they were making more money out of you, by trusting to your honor not to abuse the confidence placed in you, than to make you a flat rate and gauge same according to what customers, having a similar equipment in their houses, would use on a meter basis.

It is as just that all central stations should buy their coal, oil, waste, and all other necessities on a contract basis, not specifying the amount to be used, as that they should deliver their manufactured product and not know just how it is to be used.

Some years since, when gas companies had no actual way of measuring their output, it was essential that a flat rate be used; to-day, however, I doubt if you can cite me a single case where the meter basis is not adopted. Likewise, electricity. A very short time ago meters were unknown to any of us; to-day over 50 per cent. of the central stations throughout the country are using meters, and I daresay that the manufacture of electric meters is increasing more rapidly than any other item manufactured by electric companies. The authentic figures from one manufacturing company alone (the General Electric Company) are as follows: 1889, capacity 10 meters per week; 1895, capacity 500 meters per week. The above figures readily show the desirability of having your station output on a basis which permits of no abuse; and why should electricity be sold on any other basis?

The point has been well established that, with a complete meter system in use, and with rates properly fixed, a central station can supply light, from any given station capacity above 1,000 lights, to 30 per cent. more lamps than could the same station capacity if operating under contract system; each lamp, however, netting about the same income per annum as would each lamp under contract system. This statement may sound extravagant; but the facts are plain. On contract system each consumer uses light with indiscretion and thoughtlessnes. Now, contracts are based on the amount of light each customer needs during dark hours, but you will agree with me that, with a fixed bill each month, the average consumer, no matter how honest he may be, speedily grows into the habit of carelessness, resulting in the constant use of lamps in such places as cellars, closets or other dark places, where their constant burning is unlikely to be detected by representatives of the illuminating company. On a meter basis the conditions are immediately changed. Economy teaches the consumer to use light only when needed, and statistics from all over the country go to show that human nature calls for the burning of about 30 per cent more light when the bill is beyond the consumer's control than when it is under his control. Nearly every central station man will appreciate this, and will corroborate these figures. Many complain that meters are not true, and this complaint is almost universally from those who have been accustomed to a flat rate, and who are surprised at their own extravagance. It is an actual fact that these same complaining parties, after they have used meters for a short time, consume less current than those who have never been on anything but a meter basis.

Acknowledging that meters should be used universally in the sale of electric light or power, we next have to consider what points of merit, and demerit we must watch for and guard against in any system of meters that is to be adopted. Accuracy, of course, is one of the main points. I anticipate that in a short while a gas and electric light commission will watch over this question in all States, as they already do in some.

The natural tendency in mechanical meters is toward slow running; this can be obviated to a great extent by care given the instrument. There are too many meters now in operation that have not had their covers removed, much less been cleaned out, in the past six months. A meter should be given an overhauling at least three or four times a year. It does not require five minutes' work to clean a meter, and I assure you there is no other piece of machinery employed by central stations which will net as good results for the attention given as will your meters. Not only does the care given the meter add to the accuracy of the instrument, but it prolongs the life of same. The question has already been discussed before this Association as to what was the proper instrument to use—the ampere meter or the watt meter. We may fairly assume that the basis under which the electric light companies intend to do business is identical with that of any other manufacturing concern. A given commodity is produced at a given cost, and is to be sold at a given price. The question is, should the unit of this commodity be the ampere or the watt? The watt is undoubtedly the true unit; it is a fixed fraction of a horse power, and the horse power is certainly the basis of computation in determining station output. The ampere bears no fixed relation to the horse power, and its value fluctuates with every variation of potential; and, therefore, a meter which is recording ampere hours does not give the true record value in-put at the station, as represented by water, coal, wear and tear, etc., unless the potential is absolutely fixed.

This morning the point was very forcibly presented by one of our central station men present, that he had no way of knowing the exact output of his station. The station recording meter for all circuits is to-day manufactured, and by the use of this meter the exact output of your plant can be given at any time. The gas companies, to whom we look for precedent in the illuminating business, long ago found it imperative that they should have some means of determining just how much of their commodity they produced and sent out through their mains. In all commercial enterprises it is difficult to exactly gauge and control the business unless there be some means of accurately knowing and determining just how much, if anything, is produced.

It is surely quite as important to all electric light companies to know how much of their commodity they manufacture and put out each day, as it is to a gas company or a shoe manufacturing company. The economic value of a system of station meters must necessarily prove very great, since it furnishes an absolute check in the station against coal and water consumption, and engine and dynamo efficiency on one hand, whilst in the other direction, it furnishes a check against the total indication of customers' meters, line losses, leaks and grounds. There are very few stations which would not find it of infinite value to be able to tell, day by day, how many pounds of coal they were burning for every kilo watt hour of output.

I desire to call attention to another point which was brought up yesterday in this meeting. That is, the location of meters. In installing a meter the most vital thing to guard against is excessive vibrations. A meter installed upon a wooden partition, upon which a banging door is hung, will last but a brief time; yet there are hundreds in just such situations. It is always good economy to select the firmest possible location for a meter which is available, even though it may take a little longer time to put it there. Hot locations should also be avoided, as heat tends to materially destroy insulations.

Discussion.

The Chair—The paper is open for discussion.

Mr. Judge—It seems to me the suggestion of the station watt meter is a good one. I have been in the gas business for a number of years and I never ran a gas works without a station meter, and it was by tak-

ing the difference between the station meter and the consumers' meters that we arrived at what we called the leakage. The station meter also showed us whether we were getting the proper yield from the material used. By the means of our gas meters we could always tell where our trouble was, such as leaks, etc., by testing different sections along our mains, and the station watt meter ought to yield the same results as does a station meter in a gas works. So far as consumers' meters are concerned, the watt meter is, of course, to my mind, the only true measure of the amount of energy that is sold. Some of us have ampere meters and to use them in connection with watt meters would involve a great deal of figuring, and it is some additional trouble to have two systems of measurement, I would like to ask Mr. Monroe, are the advantages that would accrue from the substitution of the watt meter for ampere meters sufficient to pay for the exchange? I suppose something could be obtained for our old ampere meters, but you would have to sell at considerable loss.

Mr. Monroe—I would not advocate it unless your conditions were such that your voltage was varying a great deal, or your ampere meters are not accurate and of no account at all. Your ampere meters need constant attention at all times, and for that reason it would be economic to discontinue them and substitute a meter that is accurate.

Mr. Judge—Suppose you have a recording voltmeter in your station and require that charts shall be regularly kept.

Mr. Monroe—There is no reason why there should be any great variation in voltage at a station, and in the event that you should have a variation it should be remedied at once. The trouble is that stations as a rule will not spend enough money to purchase accurate instruments. There are very few stations in Texas that really have a complete set of recording instruments, or instruments with which they can make a test and know they are accurate, and I think station men will agree with me on that point.

Mr. Brooke—On that line I had a little experience last fall at Waco. In a large store there I put in several Helios arc lamps, and Mr. Hobson and I tried everything we could to make them burn successfully; but we could not do it. They did not seem to get current enough, and we could not understand it. The voltmeter at the station registered 55 volts and it only required 52 to run them. After looking round for several days we discovered that the voltmeter at the station was 7 volts short, and, of course, we did not get enough current to run the lamps; but as soon as we ran the voltage up to 59 on that meter the lamps worked successfully.

Mr. Fraser—That is still another argument that superintendents should be supplied with accurate station instruments. Our friend Brooke ought to have gone to the instruments in the first place and not taken it for granted that they were right. The first thing I always do is to look out for such things.

Mr. Brooke—I was selling the lamps, not running the station, and had nothing to do with putting up the lamps.

On motion a vote of thanks was extended Mr. Monroe for his paper.

QUESTION BOX.

The question box was then opened. The first question was—

> "I have a 500-light 30-kilowatt Westinghouse dynamo, 1,000 volts, 16,000 alternations, and high speed Ideal engine, made by A. L. Ide & Son, and I wish to double my light capacity to 1,000 lights. Which would be the most economical way to make the change? I have two circuits, each wired for 500 light capacity. Would a Corliss engine, and add one more dynamo of 500 light capacity, or dynamo and another high speed engine, or to use one engine and one large dynamo of 1,000 light capacity? I would use about 850 lights up to 12 o'clock, and then lights drop off to about 400 balance of the night."

Mr. Fraser—If it were my plant I would not hesitate a moment to put in another engine and a separate dynamo, for this reason: In all cities after a certain time at night the load is cut down 50 per cent., probably. If he has a separate engine and a separate dynamo besides the one he now has, instead of cutting his lights or load off that dynamo and allowing that same engine to run, he can shut down one and let the other run. Another thing: Should anything go wrong with one of the dynamos or one of the engines, he can arrange it on his switchboard to cut out a certain number of lights off one dynamo; say, for instance, he has 1000, he can so regulate his circuit that probably the business section would be separate from the residence section. Suppose the 1,000 light gave out and he has got 800 lights, he can regulate it so that he can cut out 300 of the residence and suburb lights, and still keep 500 lights running in the business portion of the town. There is nothing better, in my estimation, than to have a plant divided so that you can cut out and cut in different circuits, according to the exigencies of the occasion. I would, therefore, make a separate steam and electric installation in addition to the one he already has.

The Chair—Under the circumstances I would most certainly put in a Corliss engine, and connect the old dynamo and a new one of desired capacity to a countershaft, with my Corliss engine at one end of the countershaft and my Ide engine at the other, so that either could be used to run either dynamo, and the larger or Corliss engine used to run both.

Mr. Eddy—The station I run is not as well regulated as Mr. Fraser would have it, but my residence lights are on a separate circuit, and, as the Company are now contemplating throwing out the high speed engine and putting a Corliss engine in to run the machinery, this question has a good deal of interest for me. Our chief engineer has figured it out, and will, he says, demonstrate to the stockholders a saving in cost of operating that will pay for the engine in 18 months.

The Chair—Several years ago a member of the Engineers Club at St. Louis read an extensive paper on high speed engines, and during the course of his paper he referred to the fact that the engines used in the navy and merchant marine were all short stroke engines, and that he had a great deal of respect for the marine engineers, and referred to a member of the Club who was present (an engineer in the United States Navy) to verify his statement. The gentleman referred to said it was true they were all short stroke engines, but that they were as long as they could possibly get them. They were not using the short stroke engines because of their efficiency, but because of the limitation of space.

Mr. Oliger—I am like Mr. Fraser. I think that the small engines and small dynamos should give better satisfaction and better results.

Mr. Starr—We have to double our capacity, and I expect to put in another dynamo and another engine.

> Question No. 2.—"To what candle power can coal gas be enriched with oil without danger of smoking; to what candle power can coal gas be enriched with cannel coal without danger of smoking?"

Mr. Fitzgerald—The question of candle power is something that I will not be able to say very much about; but last August we commenced using oil gas to enrich the coal gas, and made during the winter about 30 per cent. of oil gas which carried the candle power, as near as I can tell, up to 30 candles.

The Chair—I do not believe it is desirable to furnish over 22 or 23-candle gas, and I know it can be run up to that with cannel coal or oil, and I do not believe it is desirable to run it over that.

> Question No. 3.—"What pressure is best for gas stoves, that is, provided the burner gas opening and air supply are properly made in each case, will the stove be most easily managed under a 10-tenths, 20-tenths or a 30 tenths pressure?"

Mr. McGoldrick—We aim to run 15 or 16-tenths at the stove, and we carry as high as 17-tenths pressure in the mains. We have an automatic governor which is set for a variation of 17 to 22.

Mr. Judge—In supplying gas stoves we had no trouble in carrying a pressure of 15-tenths in the day time to any of our customers, but our works are situated in the low part of the town. If you have a burner adapted to a certain candle power (say 17 or 18-candle) gas, you cannot raise that candle power any considerable amount without causing smoke.

Mr. McGoldrick—As to pressure on gas stoves, I find it depends a great deal upon connections and service pipes, and a great many times on the kind of stoves. You will buy stoves with connections ranging from 1 inch down to ¾. I recommend always putting in not less than 1-inch connections.

Mr. Fitzgerald—Regarding the question of pressure, I will say, in the Houston works we have a governor there which is adjusted to give 14-tenths in the day time and 21-tenths at night. Our works are a little lower than the town. I do not find in any part of the town that I have any trouble through lack of pressure, and gas stoves work satisfactorily.

The Chair—My idea is that the best pressure on which to run a gas stove is the lowest pressure at which it will operate successfully. If I could run on a day pressure of 1 inch I would do it. We carry a 1¼-inch in the day and 2¼-inch at night. I tried a 1¼ and 2¼, but could not do it.

> Question No. 4.—"Provided your mains are large enough, is it best to carry a uniform pressure day and night, or to increase the pressure during the heavy lighting hours?"

A Member—Increase during the heavy lighting hours.

Question No. 5.—"Is it true economy for hotels and large buildings to own and operate lighting plants? If not, how can we best show them that it is not real economy? If so, how can a building using 100 or 1,000 lights supply itself that number cheaper than a plant with a capacity for 10,000 or 100,000 lights can supply 100 or 1,000 lights?"

The Chair—I think if those queries were carried over until our next annual meeting we would probably be able to get some answers, as they are too extensive for an impromptu discussion in the limited time that we have at our command.

Question No. 6.—"What is the most convenient form, and what items should be included in making a daily, weekly or monthly statement of cost per 1,000 feet of gas in a holder? This statement to be used more as a comparative statement and as a quick method of calling attention to any unusual increase in any item or items. What is the most convenient form and what items should be included in making a monthly or annual statement of cost per 1,000 feet of gas in holder, to include everything from labor and coal to a fair return on investment?"

The Chair—As there seems to be no one disposed to answer this question, I will promise to have a short paper on the subject presented at the next annual meeting.

Question No. 7.—"What is the experience as to street gang interfering with bond wires of electric car lines?"

The Chair—Some time ago the City Electrician of Dallas made a report on electro-chemical action on gas pipes and water pipes, in which report he stated that the street gangs of the gas and water men cut the bond wires, and in that way the current was forced to go to the street mains, and I have, therefore, asked this question to get the experience of the other gas men and water men as to their experience.

Mr. Fraser—In getting that paper up I do not know that I insinuated that the gas men had done anything. My chief object was to throw the burden on the city forces more than on the corporations. Take, for instance, when a force is put on the street to fix the blocks that pave the street or to fix water or gas mains. The gas men are just as guilty as any of the others, but, of course you can't expect a man to plead guilty, and the fact is that a pick will sometimes strike the bond wires and the current being released goes straight to the mains, and the latter are injured. Throughout the entire country, where electric street railroads are, people can testify that the losses in footing up accounts at the end of the year are excessive. Of course, if those bond wires were not necessary they would not be there, but something has to be done to make the street car companies put in larger wires and longer wires, and also to watch that the street gangs do not interfere with them.

Mr. McGoldrick—I have had some experience with bond wires myself. A main that has given us a great deal of trouble where the railroad crosses is located close to the 10th street power house of the San Antonio City Railroad. On taking up the main, we discovered that the railway company had its bond wires grounded to it, consequently, electrolysis had set in. I removed the wires from the main, and I have had no more trouble at that place since.

Question No. 8—"We would like to know if Messrs. Chas. A. Schieren & Co.'s perforated double leather belting, or any perforated leather belt, is advantageous over the plain belting or not?"

Mr. Cullinane—I think so. I believe it is a question of personal opinion, however.

Question No. 9—"Which is the most economical arc lamp system—alternating current, incandescent, or direct current arc, where as many as 20 arcs are required; 8 all night; 12 to 10 o'clock."

Mr. Monroe—The relative efficiency of the two lamps is as follows: The alternating arc lamp consumes 30 volts, 15 amperes, 450 watts. Series arc lamps, 2,000 candle power, consume 10 amperes, 150 volts or 1,500 watts, but the difference is more than made up in the loss in the converter, and then it becomes a question as to what converter has the highest efficiency.

Mr. Fraser—My experience is that for inside lighting alternating arcs are all right on an incandescent system, but for outside use I prefer the straight arc light machine.

REPORT OF COMMITTEE ON DEATH OF MR. W. T. M. MOTTRAM.

Whereas, An all-wise Providence has removed from our Association our beloved and esteemed co-worker, W. T. M. Mottram; be it

Resolved: That in the death of Mr. Mottram our Association have lost a valuable and zealous member; that this Association extend to his widow their heartfelt sympathy in her time of great bereavement, and that these resolutions be spread upon the minutes of our Association, and a copy mailed to his widow at New Orleans.

Respectfully submitted,

J. D. OLIGER,
W. M. BROOKE,
H. L. MONROE,
} Committee.

(Adopted.)

Mr. Fuller—I beg to offer the following resolution:

Resolved, That the Secretary is hereby instructed to notify the gentlemen who appear on our rolls as Active or Associate Members (being enrolled) as they were signers for meeting to be held in Houston, for the purpose of organizing the Association, and as they have failed to pay the initiation fees as prescribed by the By-laws, that these fees must be paid within 60 days, and if not paid by that time he will consider that they do not wish to continue members of the Association; and, consequently, their names will be dropped from the rolls without further notice. (Adopted.)

ELECTION OF OFFICERS.

The following officers were elected for the ensuing year:

President—Thos. D. Miller.

Vice-President—A. E. Judge.

Secretary and Treasurer—F. R. Starr, Jr.

Executive Committee—J. H. Fitzgerald and L. T. Fuller. Mr. J. R. Cullinane being elected to fill the unexpired term of Mr. C. D. Brann.

Committee on Revision of the Constitution and By-Laws—J. R. Cullinane, W. E. Holmes and F. R. Starr, Jr.

On Membership—W. M. Brooke, H. L. Monroe, J. C. Weaver and C. W. Hobson.

The next place of meeting is in the hands of the Executive Committee, but the Association expressed a desire to hold it in San Antonio

VOTES OF THANKS.

On motion of Mr. Monroe the following resolution was adopted:

Resolved, That this Association extend a vote of thanks to the street railways of Dallas for the courtesies extended us, and that we ask the correspondents of the daily papers to insert this in their next issue.

On motion, the thanks of the Association were extended to the Oriental Hotel for the use of the meeting room, and also to the citizens of Dallas for their generous and hospitable entertainment on the previous night.

On motion of Mr. McGoldrick, which was adopted, a vote of thanks was extended to the Arrangement Committee, he stating that he thought they deserved a great deal of praise at the hands of the Association.

OFFICIAL ORGANS DESIGNATED.

On motion of Mr. Brooke the following resolution was adopted:

Resolved, That the AMERICAN GAS LIGHT JOURNAL and the *Electrical World* be chosen as the official organs of the Association.

On motion the meeting was adjourned, subject to the call of the Executive Committee.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE new proprietors of the gas plant at Ashtabula, O., are pushing the business for all there is in it, and are making some very extensive additions to the main system. At present there is a big demand for gas stoves, and there is a very satisfactory increase all round in output on both illuminating and fuel account. The progress so far scored is largely due to the energetic efforts of the Company's efficient Superintendent, Mr. P. E. Hall.

THE United Gas Improvement Company has received from the Standard Gas Light Company, of this city, an order for a fourth set of its standard double superheater Lowe water gas apparatus. This setting will increase the Standard Company's manufacturing capacity by about 1,500,000 cubic feet per day.

MR. EDWARD PIERSON, for many years Secretary and Treasurer of the Morristown (N. J.) Gas Light Company, died at his home in Morristown on the evening of Friday, May 29. He was in his 84th year, and was much esteemed by his fellow-townsmen.

THE proprietors of the Consolidated Electric Light, Gas and Power Company, of Woodlands, Cal., have awarded a contract for a new gas generating plant to the builders of the Van Syckle system of apparatus.

THE proprietors of the Carlisle (Pa.) Gas and Water Company have ordered the discontinuance of the practice of charging a meter rental.

AT the annual meeting of the shareholders in the Consumers Gas Company, of Reading, Pa , the officers chosen were: Directors, Henry Baumgardner, Richmond L. Jones, Edward C. Lee, Samuel T. Bodine and Wayne McVeagh ; President, H. Baumgardner ; Secretary, John H. Keppelman. We understand that the manufacturing plant, at the foot of 5th street, will be enlarged—in fact, doubled—and that important additions will be made to the distributing system.

THE proprietors of the Consolidated Gas Company, which supplies gas on the South Jersey coast, between Red Bank and Asbury Park, have ordered a reduction in the selling rate. Under the schedule the gross per 1,000 is $1.60, with 10 cents off for payment of bills within 10 days. Formerly, under the rule of separate Companies, the respective rates at the places named were as follows: Red Bank, $2 ; Long Branch, $1.75 ; Asbury Park, $2.

IT is reported that Editor Hoyt, of the Haverhill (Mass.) *Bulletin*, is said to be a candidate for the place on the Board of Gas and Electric Light Commissioners now filled by Mr. Morris Schaff, whose term expires in July.

AT a meeting of the Board of Directors of the Brookline (Mass.) Gas Light Company, held on the morning of May 29, the following resolution was unanimously adopted :

"*Resolved*, That for the purpose of raising money for the payment of obligations incurred for the enlargement and extension of its plant and the purchase of real estate for the use of the Company, this Company issues bonds to the amount of $1,000,000, payable in not more than 30 years, bearing interest at not exceeding 6 per cent. per annum ; and to secure the payment of the principal and interest of the same by a mortgage of its franchise and other property." Subsequently, Mr. Burrage, of counsel for the Brookline Company, filed the necessary petition to the Board of Gas and Electric Light Commissioners for permission to issue the mortgage, and the Commission named 2 P.M. of the 11th inst. as the time and date for a public hearing on the petition.

THE following letter explains itself :

NORFOLK, VA., May 28th, 1896.

To the Editor AMERICAN GAS LIGHT JOURNAL: Since the writer could not have the pleasure to share by a personal visit in the benefits derived by every gas man who is able to and does attend gas conventions, such as that of the Western Association recently held in Chattanooga, yet, having by courtesy of the Secretary, Mr. Dunbar, received copies of the papers, and having read them carefully, perhaps you will permit me to say a few words regarding some of them, by way of discussion, trusting that the author of "Municipalities vs. Gas Companies" shall not consider it an impertinence on the part of the writer to venture on expressing approval and great satisfaction with the able, logical handling of the subject on the part of General Andrew Hickenlooper. Without in the least degree or desire to disparage the great ability of many of the heads of our gas companies, it may be admitted that General Hickenlooper's paper contains arguments so well put that they may help, on occasion, the best of them. If the said paper could only be brought before the reading public in suitable instalments, it would be sure to help the Gas Company that thus might make use of it. Yes, it would help any corporation, and, as the General conclusively proves, the people as much so, if his clear-cut arguments could be brought to universal attention. Yours truly, FREDERICK EGNER.

THE United Gas Improvement Company has closed a contract with the Key City Gas Company, of Dubuque, Iowa, for one of its standard double superheater Lowe water gas settings, of a daily capacity of 225,000 cubic feet. The apparatus contracted for is to be used in connection with the coal gas works, which are also being reconstructed and enlarged.

A GENIAL and homelike and hearty company tendered their congratulations to Mr. and Mrs. Edward A. Pinkney, on the evening of last Friday, at the Pinkney residence, 16 Taylor avenue, Utica, N. Y. The occasion was the twenty-fifth anniversary of the Pinkney marriage, and it was the general verdict that the host and hostess were youthful enough to go on happily together to the golden wedding goal.

WE understand that Messrs. L. P. Lowe, U. S. Grant and associates have organized the California Light and Fuel Company, which project is for the construction and operation of an opposition gas and electric light works in San Diego. Water gas, under the Lowe system, will be supplied.

PERHAPS this proposition may have been the inciting cause for the recent reduction in gas rates ordered by the proprietors of the San Diego (Cal.) Gas and Electric Light Company. In any event, the latter have announced that on and after July 1st the net selling rate will be $1.95 per 1,000 cubic feet, a reduction of 55 cents per 1,000.

THE Washington (D. C.) Gas Light Company has agreed to supply gas in the outlying settlement of Langdon.

THERE is very little doubt that the proposed consolidation of the Fall River Gas Works Company and the Manufacturers Gas Company, both of Fall River, Mass., will be organized on a basis satisfactory to all concerned.

THE St. Louis *Republic* says, referring to the damage occasioned by the recent frightful storm in that city : "When the storm was at its height the gasholder at Station C of the Laclede Gas Light Company, located at 15th and Gratiot streets, collapsed. There was no noise or explosion, but the neighborhood was terrified by the sight of columns of burning gas leaping high in the air. The holder was nearly filled at the time, and the full force of the wind caught it and turned it over. As the immense iron columns which supported the tank proper fell, the gas was ignited and burned for a few moments at a fearful rate. Nearly all of the columns fell in the grounds of the Company. They are 115 feet long."

THE syndicate that recently bid $20,000,000 for the Philadelphia municipal gas plant, despite the scant encouragement it received on the first trial, has renewed its bid. The application was referred to the Finance Committee of Select Council, where it is likely to remain.

THE city offices of the Berwind-White Coal Mining Company have been removed from 55 Broadway to the Washington Building, No. 1 Broadway.

MESSRS. GOODWIN AND HUBBARD, the proprietors of the Gainesville (Fla.) gas works, are making notable betterments thereon.

MR. DANIEL R. RUSSELL, Vice-President of the Parker-Russell Mining and Manufacturing Company, of St. Louis, Mo., desires us to say that the factory was in no way injured by their cyclone that brought such dire disaster to St. Louis. The path of the storm was about a mile to the north of the site of the Parker-Russell works.

A CORRESPONDENT forwards the following particulars respecting the life of Mr. William Stanbery, formerly President of the Pekin (Ills.) Gas Light Company: "Mr. William Stanbery, a prominent resident of Pekin, died at his home in that city on the afternoon of May 31. It is difficult to write of such a man as William Stanbery, especially for one who knew him so intimately as did the writer. Deceased is numbered among the earlier settlers of the city, and is one whose indomitable energy has aided much in carving out its history. It was in 1847 that he took up his residence in Pekin, and ever since that date he has been identified with every forward movement and every effort to advance the interests of the city. He was born in Newark, Ohio, January 1, 1816. His father, William Stanbery, who was a native of New York City, settled in Newark in 1814. He came of a long and ancient line, his paternal grandfather being Jonas Stanbery, noted as a physician in the East. The family is of English origin. Mr. Stanbery's father was one of the most noted lawyers of Ohio, and held a foremost place among the legal fraternity of the West. He also served as State representative, and served for six years as a Member of Congress. In politics he was a Whig, and afterwards a Republican. After finishing a common school course Mr. Stanbery entered the Miami University, of Oxford, which was then one of the noted educational institutions of the West, from which he graduated in 1837, with the degree of A.B. After his graduation he took up the study of law, and in 1840 was admitted to the bar. He served as Master in Chancery in Newark, Ohio, until 1847, when he removed to Pekin. When he first came here he purchased a tract of nearly 500 acres, and for 10 years engaged in farming. In 1839, in Newark, Ohio, he was united in marriage to Miss Emma J. Woodbridge, a native of Connecticut. Their golden wedding was celebrated in 1889. Mrs. Stanbery died in 1891. Two children survive, Mrs. Ella A. Barber and Frank H. Stanbery, both of whom reside in Pekin. Mr. Stanbery has always been identified with

the business interests of Pekin. In 1857 he bought the City Mills, and, in 1866, formed a partnership with John Stoltz. In 1873 he became President of the Pekin Gas Light Company, and during his occupancy of that position by his careful management made it one of the foremost institutions of the city. Mr. Stanbery was the last living charter member of the Episcopal Church of Pekin, and since 1849 has held the position of senior warden. He was one of the most notable characters in the city. Old-fashioned in his ideas, with the old-time notions regarding honesty and uprightness, his word was as good as his bond. He held and deserved the honor and respect of every resident of the city. His character was moulded after the stern pattern of the men who have made the United States what it is to-day; and the city and county owe much to his indomitable spirit and energy. With his death one of the most prominent figures in the city's history passes away, but the memory of the man will live long after the stone, which will rest above his head, has crumbled to dust, and long after all that is of earth has disappeared. His life has been a grand exemplification of what a man, unaided and alone, can accomplish. Were words at my command I could say much; but they fail. The funeral services were held in St. Paul's Episcopal Church, at 2 P.M. of Wednesday, the 3d inst."

ARTICLES incorporating the Gas Consumers Saving Company, of Des Moines, Iowa, have been filed by Messrs. H. W. Hauke, A. C. Hillman and Robert Christienson, all of Minneapolis, Minn. The concern is capitalized in $25,000.

A TRAVELING "meter inspector (?)" recently visited Gloucester, Mass., and in the course of his peregrinations and trials of meters in use he succeeded in obtaining the permission of the authorities to test the meters in use in the public buildings. In all eight meters were tested, and the traveler reported that five of them were 5 per cent. fast, the others coming within the legal limit—2 per cent. either way. The authorities placed these findings before Mr. J. A. Coffin, Superintendent of the Gloucester Gas Light Company, with the statement that a rebate would be insisted upon in respect of the gas charged for, the rebate to apply to a certain period of time in the past. Mr. Coffin said there was only one inspection certificate that he could recognize, namely, that issued by the State Inspector of Meters, and that he would cheerfully forward to that official the meters under suspicion and abide by the results of his examination. Accordingly, the eight meters, and another one that the authorities thought should be tested, were shipped to Inspector Jenkins. In due time he returned the meters, with a statement of the results of the tests thereon, which statement showed that one meter was 2½ per cent. fast—one-half per cent. above the limit; seven meters were within the limit, and one meter was 6 per cent. fast—this meter registered the gas passing to the burners that illuminate the tower of the City Hall. The Company is anxious to have only accurate meters in service, and Superintendent Coffin, while he will deal sternly with the peripatetic gentry of meter "inspectors," holds himself in readiness to have the meter of any customer examined according to law, which directs that any consumer wishing to have his meter tested shall notify the Gas Company of his desire. If the meter shall be found correct the cost of the examination shall be paid by the consumer, but if a variation of over 2 per cent. is found the expense shall be paid by the Gas Company, which shall also furnish a new meter.

ELSEWHERE we note that the syndicate which some time ago attempted to purchase the Philadelphia gas works has renewed its effort. In supplement of that notice we append the following, forwarded by a Philadelphia correspondent: "The old project providing for the sale of the gas works, was revived in Select Council, which met in special session May 27th, by Mr. Edwards, who presented a bill, as he stated, by request, which has that end in view. According to the terms of the measure the works are to be sold to a corporation, to be incorporated by or on behalf of Howard W. Lippincott, Thomas Devlin, John Maneely, John T. Dailey, Edward Tredick, John W. Baker, H. C. Chipman, Christian Ax, Thomas C. Basshor, N. G. Munson, H. C. Turnbull, Jr., and O. E. Robinson, to be known as the Philadelphia Gas Company, and the price is fixed at $20,000,000. The money is to be paid as follows: $250,000 within 15 days of the final passage of the bill; $4,750,000 within six months after the date of the first payment, when title to the gas works shall be conveyed to the purchasing corporation, to which the works and property shall then be turned over. In the event of the Company failing to pay the second instalment the $250,000 first paid shall be forfeited and the ordinance shall become null and void. The remainder of the purchase money, $15,000,000, shall be paid in cash into the City Treasury within a further period of one year after the corporation acquires the title to the works. The purchasing Company is obligated to pay for all materials on hand and for the gas in the holders. It shall spend at least $5,000,000 for improving and modernizing the plant and service, and is to be given the privilege of laying necessary mains and pipes in the streets. The gas supplied is to be of at least 22-candle power and to contain at least 600 heat units per cubic foot, and the maximum price to be charged the consumers for illuminating gas is $1 per 1,000 cubic feet. For gas used as fuel the price is to be 70 cents per 1,000. The street lamps are to be lighted at the rate of $10 per lamp per annum. After five years the Company is to pay 5 per cent. of the net profits into the City Treasury, and after 15 years, 10 per cent. There shall be 15 Directors of the Company, two of whom are to be appointed by the Mayor; and after 25 years the city shall have the privilege of repurchasing the works, at a price to be determined by arbitration. The bill was referred to the joint Committees on Gas and Law."

Electric Motor Driving.

Iron Age, in discussing the subject of electric motor driving, says that in general there are three methods coming into vogue in the employment of electric motors for driving machine tools—*i. e.*, a motor operating but one machine, a motor so arranged as to drive a small number of tools grouped about or near it, and a motor driving a single line shaft, or all the tools placed upon one floor. Of these the first is the most difficult to install in order to obtain the best results from an economical standpoint. When the tool only requires a fraction of a horse power for its operation it is not the best practice to drive it by means of a motor, the first cost of which would, perhaps, more than counterbalance the benefits arising from its use. To put this more broadly, the tools found in the usual shops, and which vary largely in the power they need, cannot all be driven economically by individual motors, or single units, for each machine. This, as is evident, does not apply to small portable tools, such as drilling and tapping machines, to which the motor is admirably adapted. In most cases where it is inconvenient and expensive to run a line shaft, and where it is desirable to place a machine, the motor is well suited, whether the power required be great or small; but unless governed by some peculiar conditions its employment for the driving of small tools alone is open to objection.

Grouping these tools and operating them from a short length of countershafting possesses decided advantages. In this method the aggregate power required is less than would be the case with individual motors, and the first cost of the plant is reduced greatly. Those who have to do with the transmission of power and the driving of many tools appreciate the fact that it rarely happens that the power required is the sum total of the power needed by each tool. A tool carrying its own motor must have at its disposal at all times a power sufficient to enable it to do its maximum work. If driven electrically, its motor must be of such size as to drive the machine to its full capacity. But such duty occurs, on the average machine, only at long intervals. Another point to be considered is the time during which the machine is idle. Owing to these two circumstances it seldom, if ever, happens that the maximum power required by all the tools in a works is called for. The subject is illustrated on a large scale in the trolley and the cable railroad. Here the work done by the engine is never the aggregate of all the power required to move all of the cars simultaneously. The same holds when applied to a machine shop. Therefore, by the plan of individual driving, an excess of power, amounting to a large percentage of the total, would have to be provided, and this surplus would be, for the greater part of the time, of no use whatever. It would represent an invested capital in power required only at long intervals.

Taking up the third case and forming our estimate upon the work which is now being done in installing electric motors, we find that the method which is advancing most rapidly is that of isolating one line shaft from all the others, as far as power connections are concerned, and driving this shaft by means of an electric motor. In instances of this kind almost all the convenience arising from independent driving is obtained, the losses due to transmission through many lines of shafting from a common source are largely reduced, and, particularly, the first cost of the plant is lessened. This arrangement permits, in a new plant, of so arranging and grouping the machines that any particular department can be run while any or all of the others are idle, thereby permitting the working of certain tools overtime or at odd hours when it would not be desirable to turn over all the line shafting in the building. New plants and additions to old ones are now being arranged with this end in view, and even some of the old establishments are being modified so as to obtain the benefit of this method as far as may be possible. In some cases the grouping has been done so as to form, in at least one department, a complete line of tools, the result being that by the operation of that single department almost any line of work can be carried on, independent of the type or size of the machines required.

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Honors for our English Correspondent.

The last half-yearly meeting of the Southwest of England Association of Gas Managers was held in Sherborne on the afternoon of April 28th. The meeting, which was well attended, was directed by the President, Mr. T. W. R. White, Manager of the Sherborne gas works. After the technical business of the meeting, which was marked by the reading of three interesting papers, that brought about some interesting discussion, the members dined together at the Digby Hotel, after which Mr. N. H. Humphrys (our special English correspondent), the Honorary Secretary and Treasurer of the Association, was presented with a silver tea and coffee service, the pieces being grouped on a silver mounted oak tray. Each piece bears Mr. Humphrys' initials, and the tray bears the following inscription engraved on a silver plate: "This testimonial, including silver tea and coffee service, presented to Mr. N. H. Humphrys by the members of the Southwest of England Association of Gas Managers as a mark of personal esteem and their appreciation of the admirable manner in which he discharged the duties of Honorary Secretary and Treasurer for 11 years. 28th April, 1896."

The President, in making the presentation, said Mr. Humphrys was an Associate Member of the Institution of Civil Engineers, and a member of the Chemical Society. During the years he had acted as their Secretary he had done his level best to keep the Association on a proper platform—abreast of the times and equal to any other Association in the kingdom. He had exhibited a keen knowledge of all technical matters connected with their industry, and they had followed him in his writings, certain that he would not make a mistake; and if he did make a mistake he was the first to acknowledge it. Mr. Humphrys had done noble work for their Association, and it was now his pleasant duty to ask him to accept that silver tea and coffee service, which he hoped would grace his table for many a year to come. In handing the service to Mr. Humphrys he was only rendering him a small token of the regard of every member of the Association, and a token of their appreciation of his services and of the papers he had read at their meetings. He was sure that the technical libraries of the country were the richer for the productions of Mr. Humphrys' pen.

Mr. Humphrys, in reply, said that he felt some difficulty in adequately expressing his feelings on that occasion. Seeing present so many friends, and remembering the time when he came as a stranger into the South of England, he indeed felt that he had reason to be thankful that he had been permitted to come to such an honorable position. He remembered when he first came to that district some of his friends told him he was not doing himself any good; that he would get into a rut and stick there. When he came to the South of England he found the greatest kindness and cordiality awaiting him. He had not been a week in the district when his old friend Mr. Sainsbury called upon him. The friendship then formed had continued to this day, and he hoped it would continue for many years more. He mentioned that because at the time he was speaking of he saw a little boy in petticoats who was now a capable and valued assistant at Salisbury. That little boy was Mr. Sainsbury's son. Subsequently he became acquainted with many others, some of whom he was pleased to see present; others had finished their career and passed to their well-earned rest.

With regard to the Association, from the members of which he had received so many proofs of friendship and cordiality, he had done what he could to draw the Gas Managers of the Southwest of England together, seeing they had so many interests in common. Their meetings had been productive of much good; they had been beneficial to themselves, and they had been the means of placing many valuable communications before the gas world generally, and before the Gas Managers of the United Kingdom. As an example, he might mention the paper Mr. Stagg had read to them that afternoon, a paper the preparation of which must have involved a tremendous amount of work, and a paper that would be useful not only to themselves but to everybody connected with the management of gas works. Then there was Mr. Richardson's paper on the Severn Tunnel. When he thought of that having been brought forward he felt their Association had done some service of which they might well be proud. With regard to their present position, although this was the last occasion upon which they would meet as members of the Southwest of England Association, there was no reason to suppose that it would be the last time they should meet together. It had been said that this was the funeral of the Southwest Association. That might be so, but if it was, they were going to a new and better and higher life, where they would get a wider experience and better opportunities for improving themselves. He thanked them very cordially for that substantial memento of the many friendships he had had the privilege of making in the Southwest of England.

Visibility of Lights at Sea.

As a result of the discussion of the subject of anchor and running lights by the International Maritime Conference in Washington, in 1889, says the New York *Sun*, special investigations were undertaken by officers of the governments of the United States, Germany and Netherlands to determine the intensity of light needed to fulfill the requirements of the law governing the rules of the road, which says that "the word 'visible' in these rules shall mean visible on a dark night with a clear atmosphere." The result of a large number of observations by the German committee gave as the distance at which a white light of one candle power became visible, 1.40 miles for a dark clear night, 1 mile for a rainy one.

The American experiments, undertaken at Long Beach light station, gave the following results in very clear weather: A light of one candle power was plainly visible at 1 nautical mile, and one of 3-candle power at 2 miles. A 10-candle power light was visible with a binocular at 4 miles, one of 29 candles faintly at 5, and one of 33 candles visible without difficulty at the same distance. On a second evening, exceptionally clear, a white light of 3.2-candle power could be readily distinguished at 3, one of 5.6 at 4, and one of 17.2 at 5 miles.

The Dutch governmental experiments, conducted at Amsterdam, gave the following results: A light of 1-candle power was visible at 1 nautical mile, 3.5 at 2, and 16 at 5 miles.

In the experiments with colored lights it is only necessary to use the green, as it has been conclusively proved that if a light of that color fulfills the tests, a red one of the same intensity will more than do so. It was found that the candle power required for a green light to be visible 1, 2, 3 and 4 miles at sea was 2, 15, 51 and 106 respectively.

The extraordinarily rapid diminution of the visibility of the green light with the distance, even in good observing weather, and the still more rapid decrease in rainy weather of a character which will but slightly diminish the intensity of a white light, shows that it is of the utmost importance to select for the glass a shade of color which will interfere with the intensity of the light as little as possible. The shade recommended is a clear blue green. Yellow green and grass green should not be employed, as they become indistinguishable from white at a very short distance. For the red, a considerably wide range is allowable, but a coppery red is probably the best.

A Systematic Error in Photometry.

The London *Journal* "notes" that in a short paper on "The Action of Light on the Iris, Demonstrated by a New Pupilometer," published in *Nature* for the 16th ult., Prof. Charles Henry describes the instrument, which proves experimentally there is almost always a dilatation of the pupil when the iris is withdrawn from the light. In any case, the variations of dimensions of the iris are much less when it is the iris alone which is subjected to light, than when the iris and the retina are influenced together. If, by means of the Houdin pupilometer, we observe the pupil of one eye while the iris of the other is obscured, we remark on the said pupil a dilatation of from one-half to one-quarter millimeter in the diameter. Among other experiments, Prof. Henry tried to find with his pupilometer the relation existing between the pupillary contraction and the illumination of the retina. This discovery of the direct action of light upon the iris leads to a number of curious conclusions. Among others, it shows that our photometric measurements must involve a slight but systematic error.

When the eye is directed toward the more luminous of two lights, the iris contracts, tending thus to equalize the lights for the retina. It is, perhaps, in this movement of the iris that we should seek an explanation of the discrepancies that are constantly being met with between the data of our photometric processes and those contributed by observation of sensitive plants. It is well known, for instance, Professor Henry says, that a branch of *Vita sativa* placed between two lights equal for our eyes and equidistant from each other, invariably tends to incline towards one of them.

The Market for Gas Securities.

The market for city gas shares presented no unusual feature since time of last writing. The bears on Consolidated, who are hibernating (oddly enough, these bears hibernate in the summer time as well as during the accepted winter season) above Cedar street, on Broadway, are getting restless, and it is only a question of a short time when they will have to repair by covering.

The popgun attempt to smother city gas shares, through the smoke of a ridiculous application to the New York authorities for a fuel gas right in New York city, has been more than discounted; so we say to our readers, buy Consolidated shares on every decline following the popgun's report. Consolidated is nominally at 154½ to 155 to-day. Equitable is wobbly, at 205 bid, at which figure it looks to be cheap; as also is Mutual, which the shoppers say can be purchased at 230.

Brooklyn Union is unaccountably dull, at 91 to 92, which shows an asking value very much below what the stock is worth. Chicago is dull, though even. We believe, at anything under 70, Chicago is a decided purchase, for the treasury standing of the concern shows its vitality. Bay State is being thoroughly rigged for the purposes of its manipulators. At 29⅝ to 29¾ it looks a sale. The bonds of the concern, however, are worth purchasing at the reported values. Baltimore Consolidated is steady at 63½ to 63¾. Another likely purchase on the list is Fort Wayne stock, which ought to be at par before January 1st. Lacledes are weak, but are below values, on account of intrinsic worth, just now.

Gas Stocks.

Quotations by Cochran & Close, Brokers and Dealers in Gas Stocks.

35 Wall St., New York City.

June 8.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$35,430,000	100	154¼	155
Central	500,000	50	150	..
" Scrip	220,000	..	100	..
Equitable	4,000,000	100	205	212
Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	114	..
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	228	..
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	..	..	..
Northern	150,000	50	79	80½
" Bonds	150,000	1,000	..	98
New York and East River	5,000,000	100	37	38
Preferred	2,000,000	100	72	74
Bonds 1st 5's	3,500,000	1,000	102	103¼
" 1st Con. 5's	1,500,000	..	92	93
Richmond Co., S. I.	348,650	50	50	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	78½	80
Preferred	5,000,000	100	108	110
Bonds, 1st Mortgage, 5's	1,500,000	1,000	108½	111
Yonkers	299,650	50	180	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	91	91¼
" " Bonds (5's)	15,000,000	1,000	105½	106½
Bay State	5,000,000	50	29⅝	29¾
" Income Bonds	2,000,000	1,000	..	42
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	84	85
2d " " "	3,000,000	1,000	66	70
Buffalo Mutual	750,000	100	125	..
" Bonds	200,000	1,000	95	100
Central, San Francisco	2,000,000	..	95	..
Chicago Gas Co.	25,000,000	100	63¼	63⅝
Chicago Gas Lt. & Coke Co.				
Guaranteed Gold Bonds	7,650,000	1,000	94	94¼
Columbus	1,000,000	..	..	65
1st Mortgage	1,085,000	..	..	96
Consumers, Jersey City	2,000,000	100	..	80
" Bonds	600,000	1,000	..	100
Cincinnati G. & C. Co.	7,000,000	100	198	199
Consumers, Toronto	1,800,000	50	184½	187
Capital, Sacramento	500,000	50	..	41
Bonds (6's)	150,000	..	..	..
Consolidated, Baltimore	1,000,000	100	63½	63¾
Mortgage, 6's	3,600,000	..	107	107½
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,400,000	..	..	..
Detroit	4,000,000	..	..	29
" Con. Bonds	4,312,000	..	76	77
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Fort Wayne	2,000,000	..	87½	90
" Bonds	2,000,000	..	98	96
Hartford	750,000	25	..	145
Indianapolis	2,000,000	..	134	138
" Bonds, 6's	2,650,000	..	104	106
Jersey City	750,000	20	180	..
Lafayette Gas Co., Ind.	1,000,000	100	93	97
Bonds	1,000,000	1,000	94	97
Louisville	2,570,000	50	..	130
Laclede, St. Louis	7,500,000	100	23¼	23½
Preferred	2,500,000	100	..	83
Bonds	9,034,400	1,000	92	93
Little Falls, N. Y.	50,000	100	..	100
Bonds	25,000	..	..	100
Montreal, Canada	2,000,000	100	200	..
Newark, N. J., Gas Co.	1,000,000	..	93	98
Bonds, 6's	4,000,000	..	123	..
New Haven	1,000,000	25	225	..
Oakland, Cal.	2,000,000	..	52	53¼
" Bonds	750,000	..	..	..
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	2,100,000	1,000	..	108
2d "	2,500,000	1,000	104	105
Peoples, Jersey City	500,000	50	..	175
Paterson, N. J.	.....	25	99	102
Rochester Gas & Elec. Co.	2,150,000	50	..	..
Preferred	2,150,000	50	88	..
Consolidated 5's	2,000,000	..	87½	90

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DIVIDEND NOTICE.

OFFICE OF WELSBACH COMMERCIAL COMPANY,
40 WALL ST., NEW YORK CITY, May 14, 1896.

The Directors have this day declared a quarterly dividend of two (2) per cent on the preferred stock, payable on June 10, 1896, to stockholders of record at the close of business May 29, 1896. Transfer books of the preferred stock will be closed from May 30 to June 10, both inclusive. Checks will be mailed.

1094-3 EDWARD C. LEE, Treasurer.

Position Wanted

Experienced man desires position as Superintendent of Gas Works or Gas and Water Works combined, or Gas and Electric Light Works combined, or separate construction of either. Supt. of combined plants nearly 7 years. Twenty five years' practical experience. First-class references.

Address "G. H. H.," 3222 Pacific Avenue,
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WANTED,

By a young man of 30 years' experience, a position to take full charge of gas works, or Superintendent of manufacturing and distribution. Coal gas works preferred, especially where regenerative benches are in use or can be introduced. All-round man in all branches of the business. Have sold 30 gas ranges so far this season; 500 Welsbach lights now in use in town of 15,000 population. Competent and reliable references as to ability and character. Salary reasonable. Best of reasons for desiring a change. Address

1095-4 "T. H. S.," care this Journal.

Position Wanted

As Superintendent of Gas Works or Gas and Electric Light Works.

Has been in the employ of the Long Branch (N. J.) Lighting Company as Superintendent for the last 11 years, and is a practical mechanic, thoroughly understanding the laying out and erection of plant and the making of coal and water gas. Best of references. Address CHAS. J. LUTHER,

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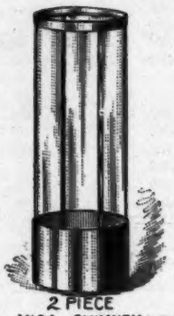

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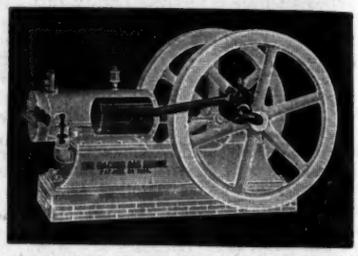

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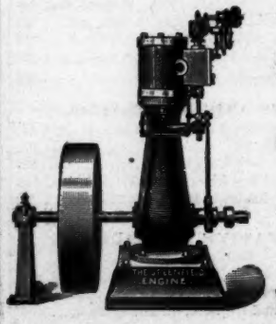

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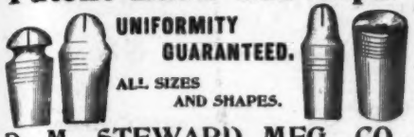
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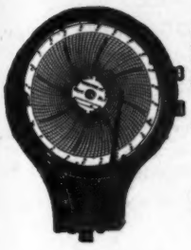
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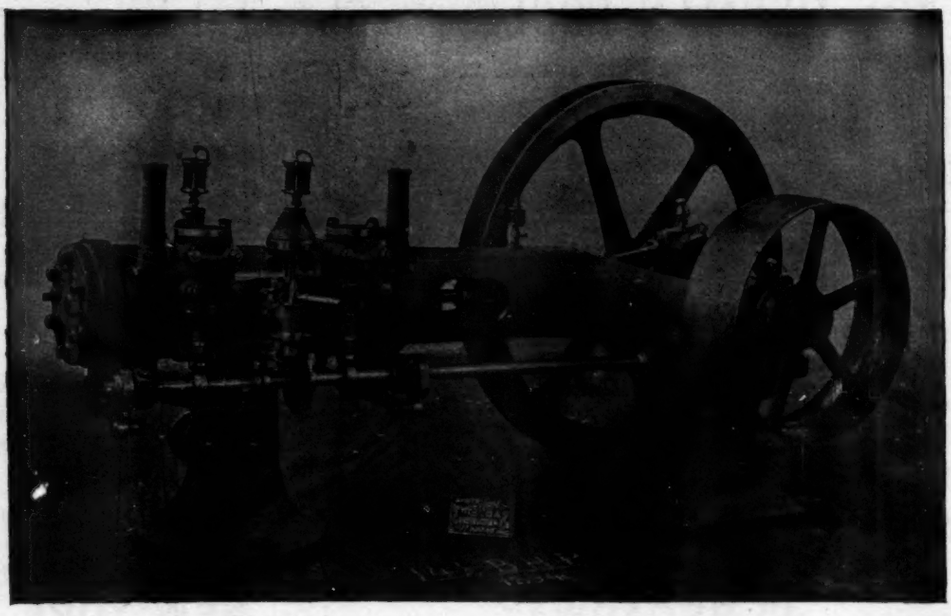
Under the Patents of Griffin, and Dick, Kerr & Co., of London and Kilmarnock.



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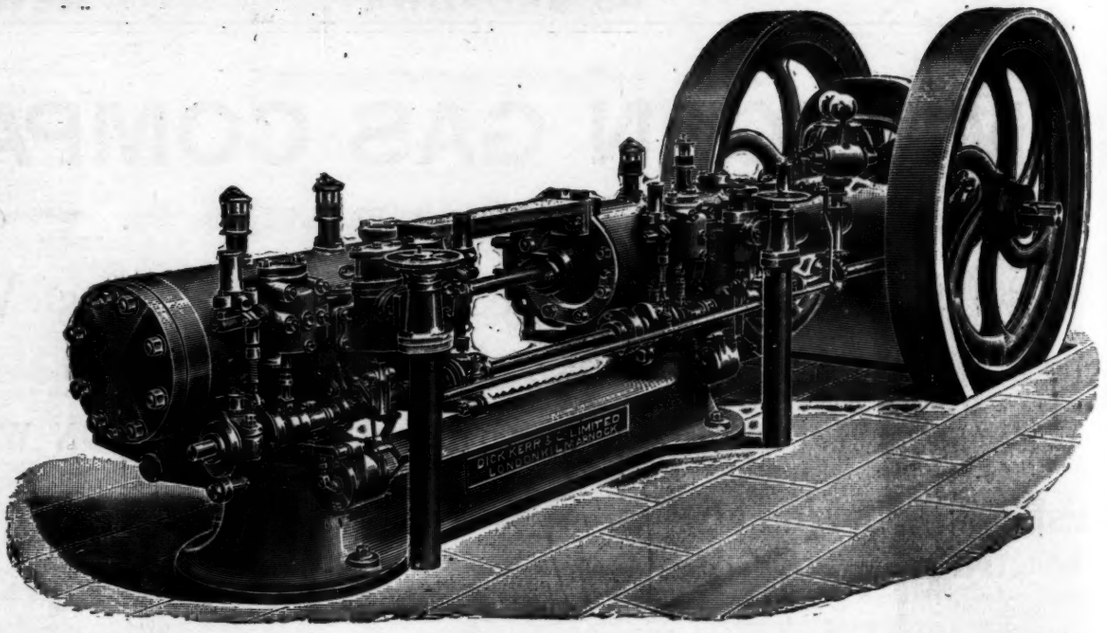
For Central Stations and all work requiring extreme steadiness.



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All infringements of this Company's patents will be promptly and vigorously prosecuted, dealers and users being equally liable. This Company will prosecute all parties in whose possession infringing lights are found.

This notice is given in view of an effort now being made to introduce into this country infringing lights made in Germany, the sale of which, there, has been prohibited by the recent decision of the German Patent Office sustaining the validity of the Welsbach patents.

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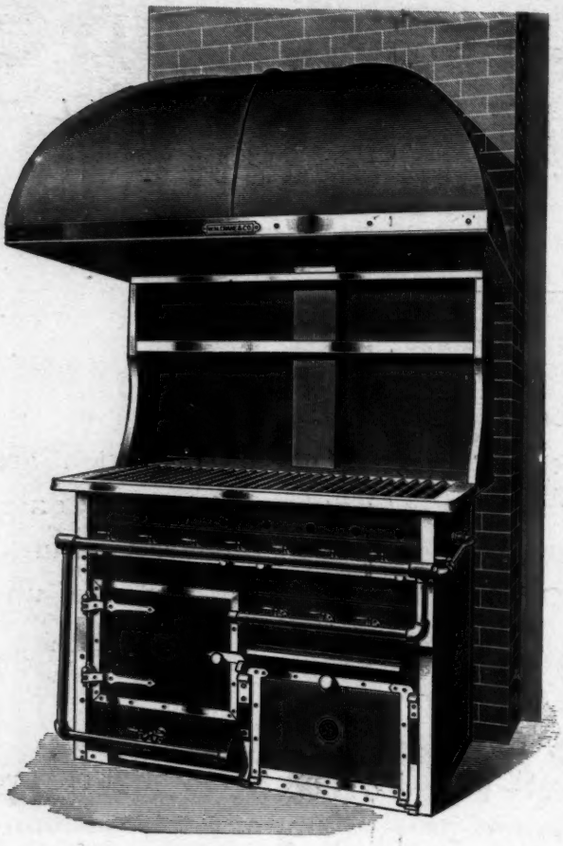

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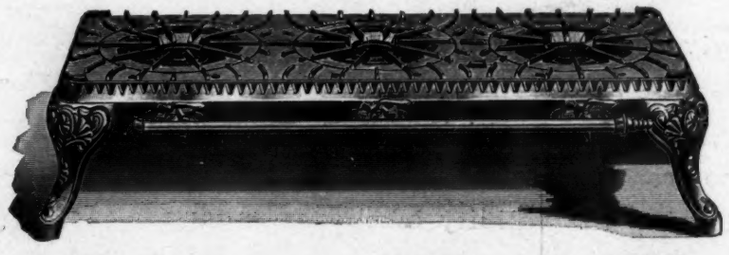

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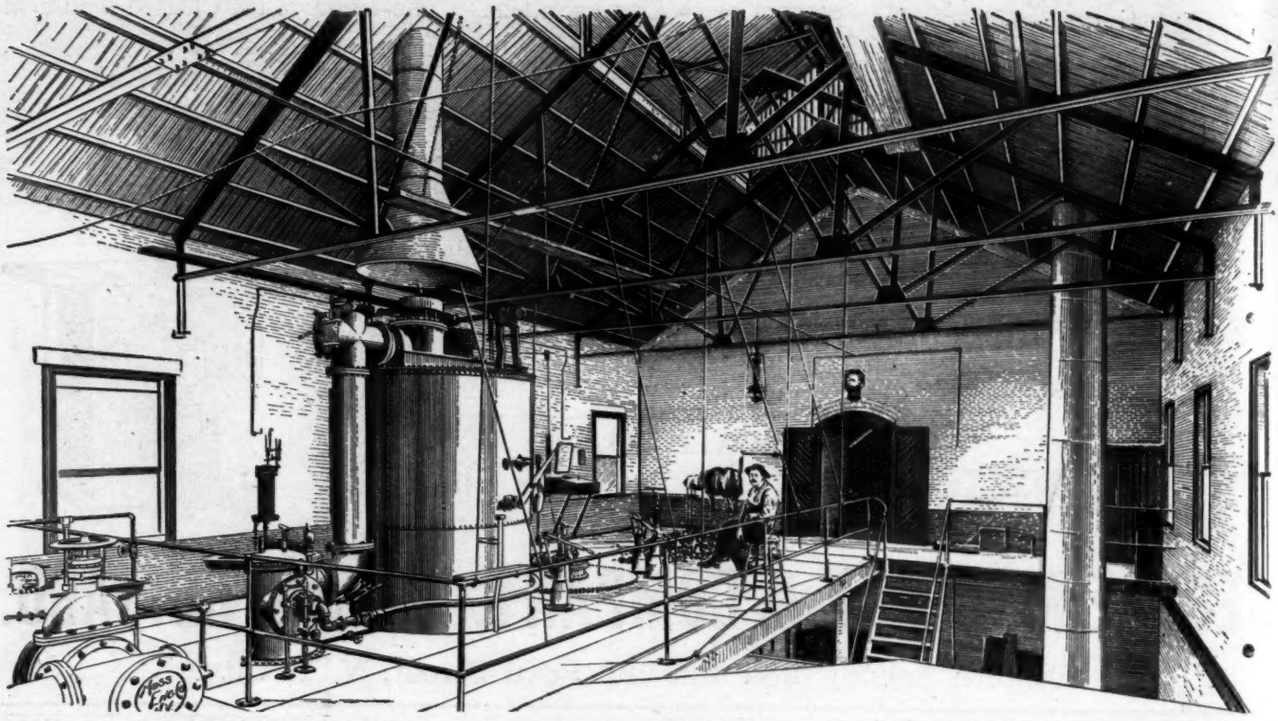

The above illustration is taken direct from a photograph, and shows the Machine Room of the New Bedford Gas Co., at New Bedford, Mass. The Roof on this building was furnished by us. The building is 32 feet wide by 150 feet long, the Roof being made entirely of iron—that is, iron trusses and iron purlins covered with corrugated iron. The room is ventilated by a wrought iron ventilator extending the full length of the building, with corrugated Iron shutters on each side opening and closing by cords from the floor.

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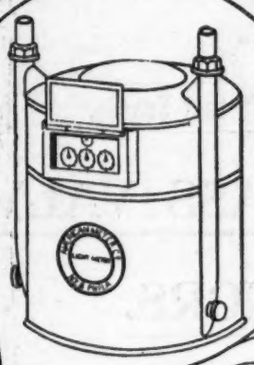
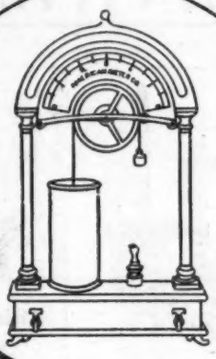
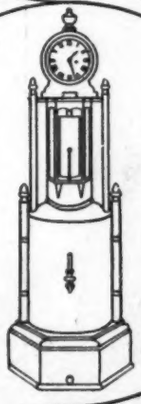
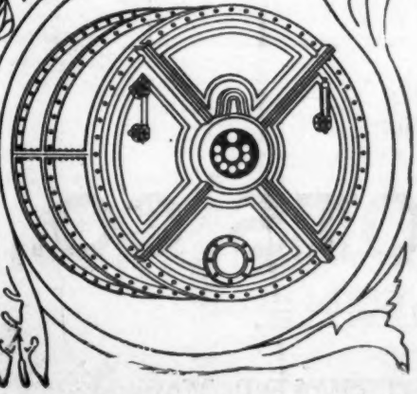




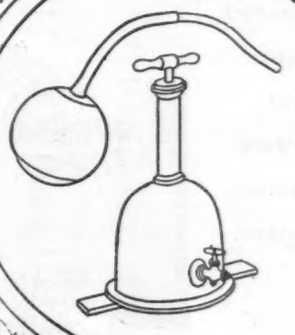


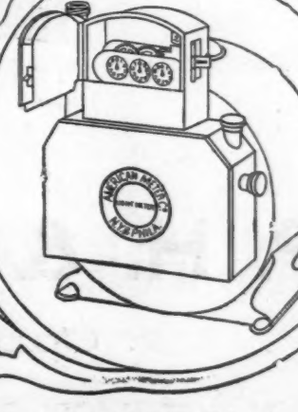


PUBLIC LIGHTING TABLE.

JUNE, 1896.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Mon.	1	7.50 PM	1.00 AM	7.15	3.15
Tue.	2	7.50 LQ	1.20	7.15	3.15
Wed.	3	7.50	1.40	7.15	3.15
Thu.	4	7.50	2.00	7.25	3.15
Fri.	5	7.50	2.20	7.25	3.15
Sat.	6	7.50	2.50	7.25	3.15
Sun.	7	8.00	3.30	7.25	3.15
Mon.	8	8.00	3.30	7.25	3.15
Tue.	9	8.00	3.30	7.25	3.15
Wed.	10	8.00 NM	3.30	7.25	3.15
Thu.	11	8.00	3.30	7.25	3.15
Fri.	12	8.00	3.30	7.25	3.15
Sat.	13	8.00	3.30	7.25	3.15
Sun.	14	8.00	3.30	7.25	3.15
Mon.	15	10.00	3.30	7.25	3.15
Tue.	16	10.20	3.30	7.25	3.15
Wed.	17	10.50 FQ	3.30	7.25	3.15
Thu.	18	11.10	3.30	7.30	3.15
Fri.	19	11.40	3.30	7.30	3.15
Sat.	20	12.10 AM	3.30	7.30	3.15
Sun.	21	12.50	3.30	7.30	3.15
Mon.	22	1.30	3.30	7.30	3.15
Tue.	23	No L.	No L.	7.30	3.15
Wed.	24	No L. FM	No L.	7.30	3.15
Thu.	25	No L.	No L.	7.30	3.15
Fri.	26	8.00 PM	10.00 PM	7.30	3.15
Sat.	27	8.00	10.30	7.30	3.15
Sun.	28	8.00	11.00	7.30	3.15
Mon.	29	8.00	11.20	7.30	3.15
Tue.	30	8.00	11.40	7.30	3.15





TOTAL HOURS LIGHTING DURING 1896.

By Table No. 1.	Hrs.Min.	By Table No. 2.	Hrs.Min.
January	220.40	January	423.20
February	207.00	February	367.40
March	193.00	March	355.35
April	174.10	April	298.50
May	164.00	May	264.50
June	142.10	June	234.25
July	142 10	July	243.45
August	150.50	August	280.25
September	163.00	September	321.15
October	193.10	October	374.30
November	207.00	November	401.40
December	237.30	December	433.45
Total, yr.	2194.40	Total, yr.	4000.00

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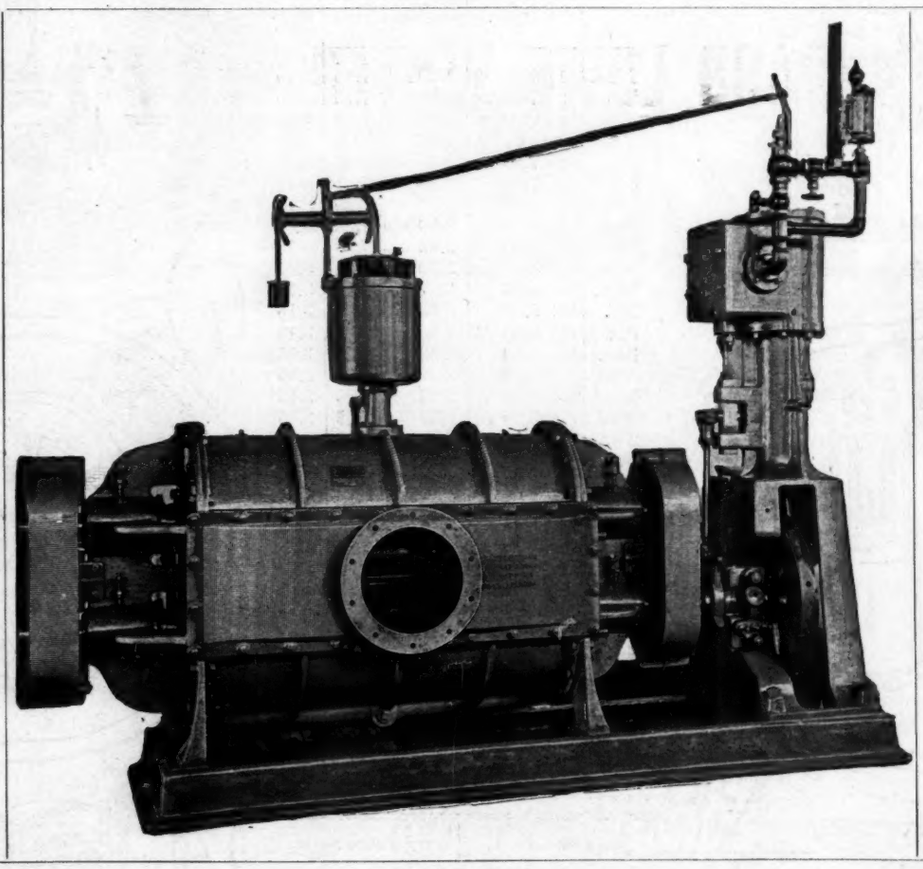

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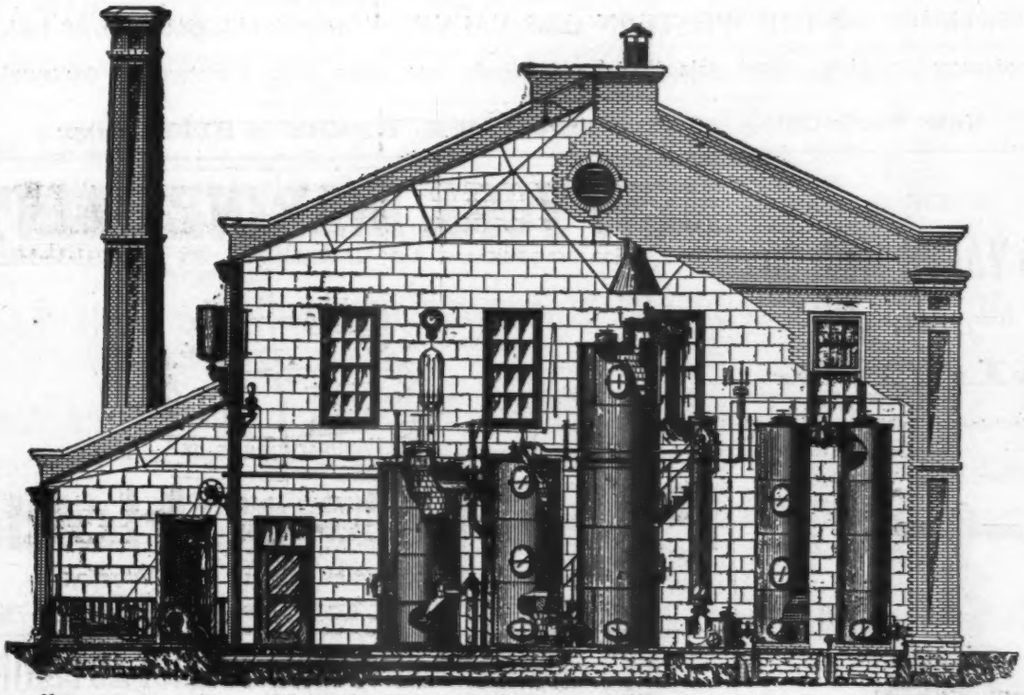

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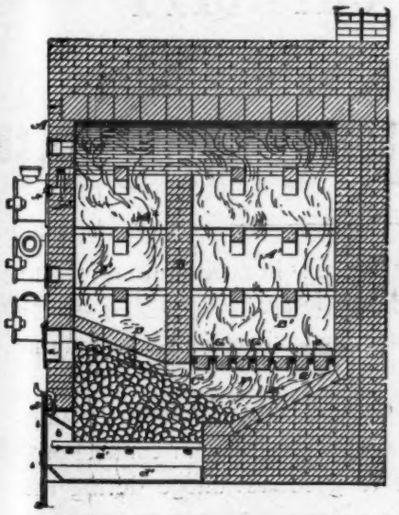

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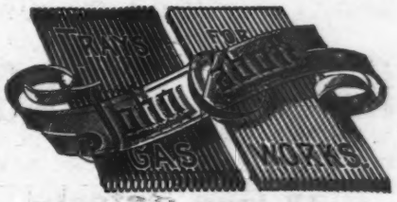

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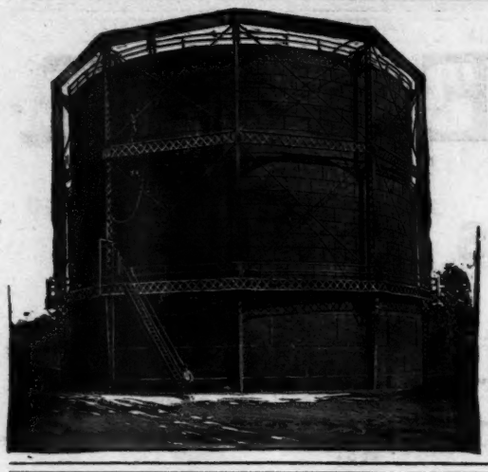

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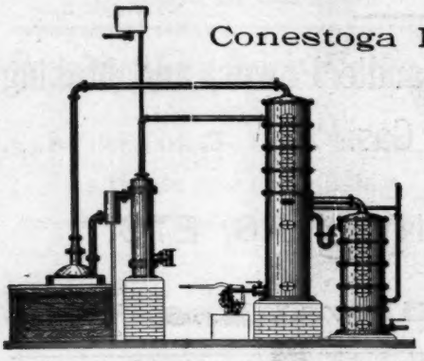

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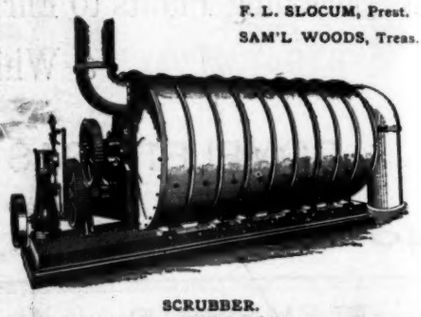

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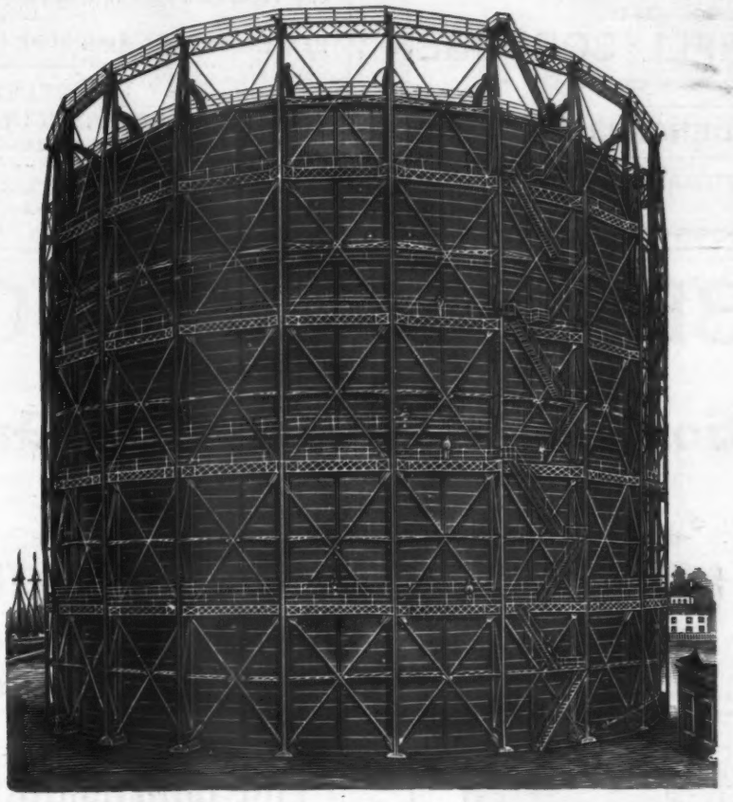

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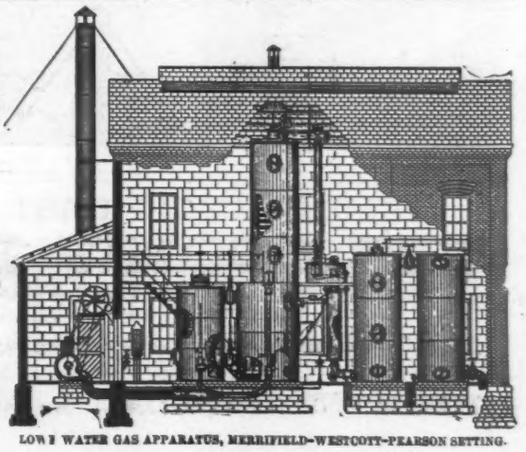

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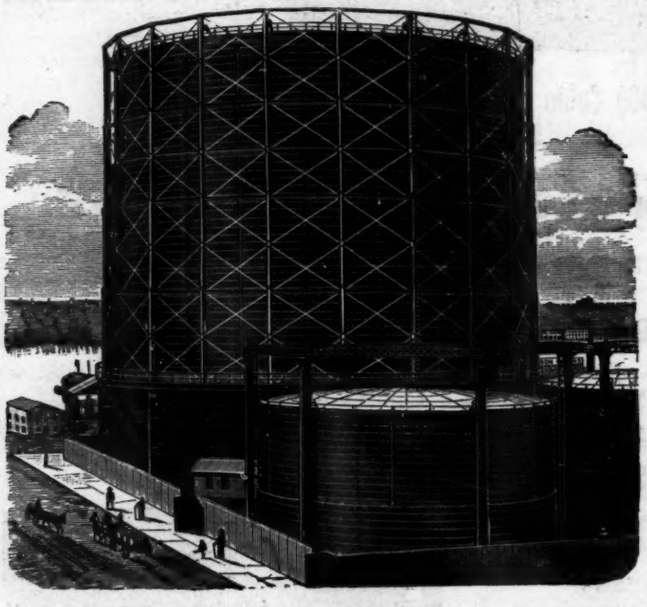

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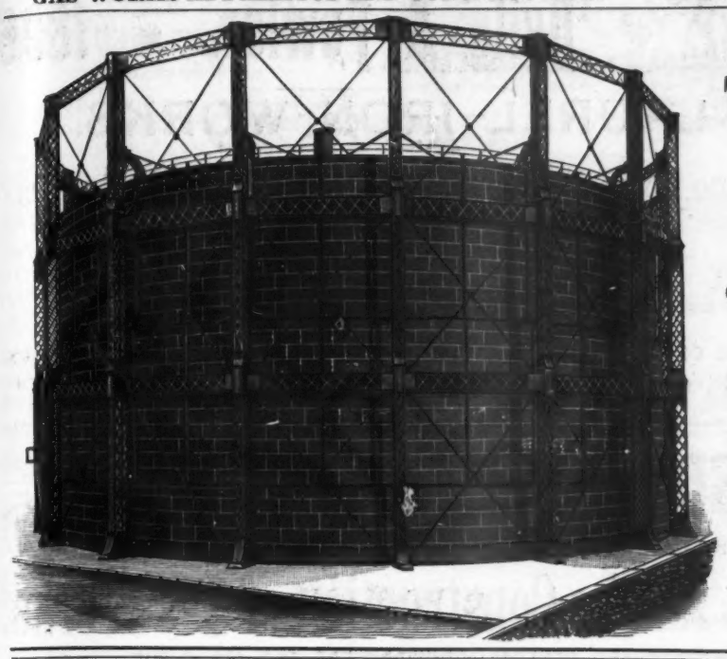

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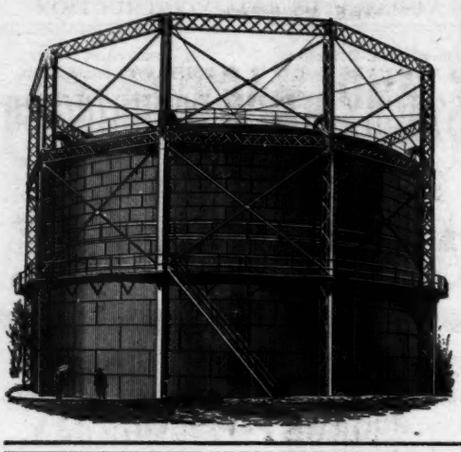

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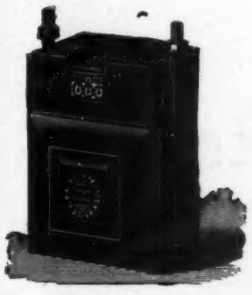

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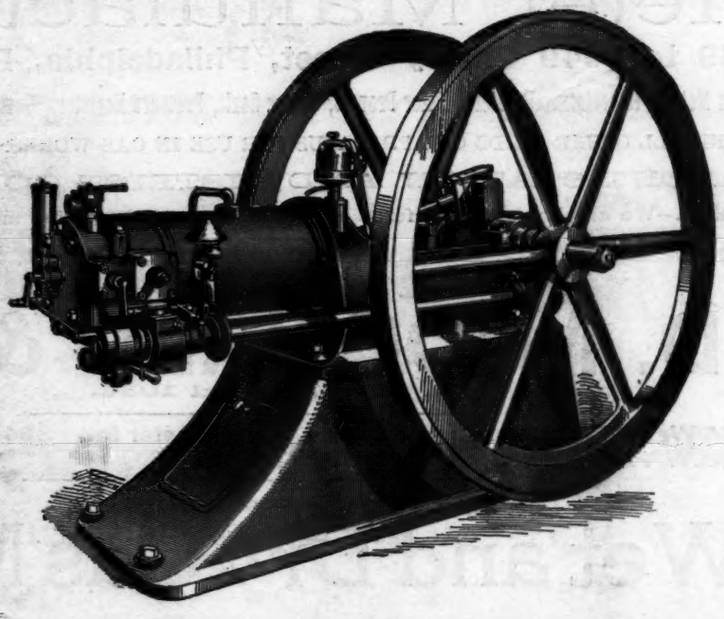

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